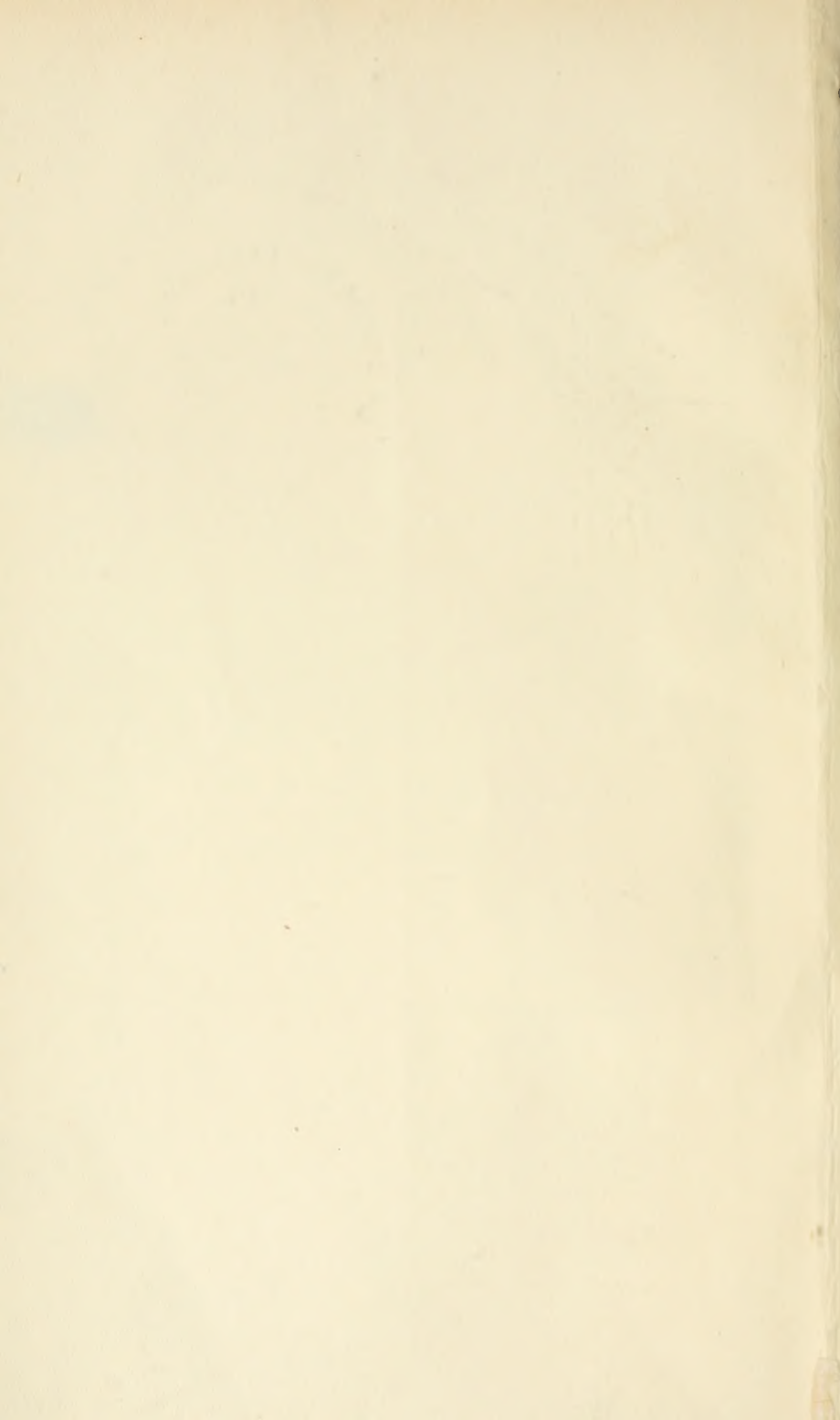


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A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

I. Subfamily *PROCTOTRYPINÆ*.

As is the case with nearly all the groups of our smaller insects, neglect has been the portion of the Oxyura for a great number of years; and it is a plaintive task to compare the general interest nowadays taken in entomology as a whole with that evinced by our grandfathers. Their numbers were certainly few, but ours, in the less-worked groups, are nugatory; nor can much more be said, in respect of this family of Hymenoptera, upon the Continent. Nothing but a well-sustained publication of the Andre's excellent 'Species des Hyménoptères d'Europe' has recently been issued of importance, but in this great work Kieffer has brought forward such a *foule* of new species, incorporated in a most comprehensive manner with those already published, that ignorance now lies at the door of wilfulness, and not necessity. In order that we should not be behind our neighbours in a knowledge of the Oxyura of Britain I have attempted, in the following concise tabulation and notes, to present a superficial notion of the 680 species already recorded from our islands, together with some initial idea of their distribution here.

The first of the eleven subfamilies into which the Oxyura are now divided is the typical one *Proctotrypinæ*, and this is distinguished from all the remainder by the following characters: Antennæ rising far from mouth. Scutellum neither discally bisulcate nor basally constricted. Abdomen not laterally margined by a carina. Wings no more than normally ciliate; front ones with a determinate stigma, but no discal triangle of nervures, its radial cell entire; hind ones not basally lobed or attenuate.

Until quite recently this subfamily consisted of the single genus *Proctotrypes*, which was beautifully monographed by Haliday in his 'Hymenoptera Britannica Oxyura' fasc. i, published by Baillière in 1839. But nowadays it has been comminuted into several smaller groups upon characters not, perhaps, too trivial to regard as genera, though the facies are in every case the same, and it is of little moment whether we accord them this rank or simply that of divisions of a single genus. It is, as Vollenhoven says, "to be regretted that Haliday's most precious

paper on the *Oxyura* remained unknown to Thomson, whilst he wrote on this "subject," but the circumstance seems to have given rise to little synonymy; the latter redescribed the abundant *P. calcar*, and possibly his *P. buccatus* is not distinct from Haliday's *P. elongatus*. Their specific distinction may be owed to Kieffer's habit of regarding everything as different till proved identical even to the last pilus (in the broadest sense of the word!). The affinities of this subfamily are not at all with the other *Oxyura*, but with the *Polymorphi* group of *Præconidae*, wherein the *Euphorids* have equally peculiarly contracted radial cell and the *Liophronids* very similar abdomen, with reflexed terebra.

NOTE.—There has been a recent attempt to sink the name *Proctotrupes* (originally spelt "Proctotrupes," presumably because the Germans possess no *u*) to *Syrphus*. Science is the essence of common sense; consequently, to alter a name that has been in universal use by scientists from the earliest times, the particular name, moreover, by which an entire group of Hymenopterous insects is known, in favour of one utterly unknown, one that is so similar to *Syrphus* of Fabricius (which antedates it) that in speech they are identical, to say nothing of any doubt that may exist respecting the synonymy—such a proceeding is, I have no hesitation in definitely stating, so far from common sense as to border upon folly. Such a course shall never be accepted by me.

TABLE OF GENERA.

- | | | |
|------|--|---------------------|
| (6). | 1. Metathorax scabrous, or, at least, with a central carina. | |
| (5). | 2. Mesothoracic notauli entirely wanting. | |
| (4). | 3. All the tarsal joints and claws simple. | |
| | | PROCTOTRUPES, Latr. |
| (3). | 4. Anterior claws trifid, fifth joint explanate. | |
| | | EXALLONYX, Forst. |
| (2). | 5. Mesothoracic notauli deeply impressed. | DISOGMUS, Forst. |
| (1). | 6. Metathorax smooth, with no central carina. | |
| | | PARACODRUS, Kieff. |

But for practical use, in a rough and ready way, I have found the following conspectus sufficiently comprehensive:

Metathorax rugose or scarbriculous throughout.

Notauli deeply impressed 1. *Disogmus*.

Notauli wanting.

Propleuræ striate; abdomen red 3. "*Syrphus*," Kieff.

Propleuræ smooth; abdomen black.

Claws dentate; onychii explanate 4. *Exallonyx*.

Claws simple; onychii slender 5. "*Phænosyrphus*," Kl.

Metanotum at least partly smooth, nitidulous

Metathorax with smooth discal area 2. "*Cryptosyrphus*," Kl.

Metathorax entirely smooth throughout 5. *Paracodrus*.

DISOGMUS, Förster.

Hym. Stud., ii, 1856, p. 99.

Eleven European and three American species are known. We have but two :

- (2). 1. Pronotum laterally tuberculate : metanotum tricarinate.
1. *areolator*, Hal.
(1). 2. Pronotum not tuberculate : metanotum unicarinate.
2. *nigricornis*, Kief.

1. DISOGMUS AREOLATOR, Hal.

Proctotrupes areolator, Hal., Hym. Brit., i, 1839, p. 13, ♂ ♀. Curt., Brit. Entom., xvi, 1839, pl. decxliv, ♀. *Disogmus areolator*, Först., lib. cit., p. 100, ♂; Ashmead, Bull. U.S. Nat. Mus., 1893, p. 332, pl. xiii, fig. 6; André, Spp. Hym. Eur., x, 1907, pl. xi, fig. 6, p. 283, ♂ ♀.

This species is at present confined to Britain and is among our rarer kinds. Taken in sylvan places in Ireland during the autumn by Haliday and in England by Walker. It has occurred to me singly on bracken at Wilverley Inclosure in the New Forest, and by sweeping long grass at Wortham in Suffolk, both in the middle of June. That it is actually much less rare than would seem is proved by its existence in my Monks Soham garden, where I have never through fifteen years found it wild. On April 10th, 1907, a piece of ordinary old willow-stump was brought in from this garden, bored by insects; in the early morning of May 10th a female of the present species had emerged therefrom; two more were out on 13th inst., and made no attempt to come up to the light; on 20th a fourth emerged; on 18th a single *Proctotrupes fuscipes* was bred; but the only other emergants were one female sawfly, *Pteronus riminalis*, on 21st at 11 a.m., four very small—too small, I think, to have been hosts of this parasite—dipterous *Sciara* sp. on 13th and 20th, and a couple of the heteromerous beetle, *Pyrochrou serraticornis*, on 13th and 20th. On May 20th, 1910, Mr. Ernest A. Elliott took the species in some quantities in his garden at Belsize Grove, in Hampstead, running over a half-decayed black poplar billet, recently felled; it was noticed upon this and a similar billet from the same tree for four years in succession, until the wood rotted and fell to pieces, in annually increasing numbers, but no probable host was detected (such as the above *P. serraticornis*). I have seen one pair from Nottingham in May, on 6th at Radcliffe-on-Trent and on 15th at Glapton, near Clifton.

2. DISOGMUS NIGRICORNIS, Kieff.

André, lib. cit., p. 285, ♂.

Unknown to me, and doubtfully British: "France et probablement Ecosse"—Kieffer. l.c.

NOTES ON BRITISH ODONATA IN 1920.

By W. J. LUCAS, B.A., F.E.S.

For myself the season commenced rather late with the capture of *Pyrrosoma nymphula*, Sulz. (a female) and *Enallagma cyathigerum*, Charp. (also a female), both in teneral condition, on 3 May at the Black Pond on Esher Common, Surrey. Thence onwards dragonflies were met with till towards the end of October.

LIBELLULIDÆ.—*Leucorrhinia dubia*, Lind. was very common at Abbot's Moss, Cheshire, in May and June (Jackson). A male and a female of *Sympetrum striolatum*, Charp. were sent to me in teneral condition, with the note that they were in remarkable profusion (14 August) on the sand dunes of the South Lancashire coast about Formby Point. They seemed very partial to resting on the Ragwort, which is a feature of the vegetation (Dallman). It was met with near Lewes, Sussex, in September (Blair). There is one record of *Sympetrum discolorum*, Linn.—a female taken on 19 Aug. by the River Wey in the Royal Horticultural Society's Gardens near Wisley, Surrey (Fox-Wilson). *Sympetrum scoticum*, Don. was on the wing at the Black Pond, Esher Common, on 15 July, but examples seemed to be teneral and probably the species was only just appearing. By 7 Aug. it was common there and a few were black in colour, but most were of a saffron tint and no doubt represented teneral males as well as females. On 7 Oct. a number were seen on the Common, and at least one was noticed on 25 Oct. (Lucas). Stowell met with it on Parley Heath (apparently in August), and strange to say this seems to be almost or quite the only record of its occurrence in Dorset. *Libellula depressa*, Linn. was common in Alice Holt, Hampshire, on 24 May (Stowell). On the 21st of the same month one at least was sighted in the New Forest. On 25 May it was seen on the shore near Mudeford, Hants, presumably having bred in the pools there, the water in which was no doubt brackish. An *Orthetrum cancellatum*, Linn. was taken at the same pools on the same day and presumably also bred there. On 25 June a nice male *L. depressa* was taken in the New Forest, where the species appeared to be pretty common. Several *L. depressa* were seen on 3 June and a yellowish teneral male was taken at Stanmore Common, Middlesex (Lucas). One *Libellula quadrimaculata*, Linn. at least was seen on 25 May over the marshy ground (no doubt brackish, if not salt) between Hengistbury Head and Christchurch Harbour, Hants. Possibly the species breeds in the marsh! One was almost certainly seen on 7 Oct. at Esher Common; if captured, this would have been a remarkably late record, for the species often appears upon the wing in April (Lucas). On 21 June *Orthetrum caeruleum*,

Fabr. was on the wing in the New Forest, though it was only occasionally that a blue specimen was seen (Lucas). On 30 May in Oberwater, New Forest, I found three naiads* of what I presumed to be *O. cerulescens* and took them away with the hope of breeding them. On the morning of 10 June a male was found to have emerged since the previous evening, and was hanging about 9 a.m. (s.t.) with wings pressed together over its back. About an hour later it had spread its wings, which were seen to be very glossy. The pterostigma was yellowish, and the body various shades of brown with yellowish markings. The insect was a male, and *O. cerulescens* as I expected. On 14 June it was moribund. It had been kept under a glass shade and had eaten nothing. Some of the gloss had disappeared from the wings, but the "cerulean" bloom had not developed on the abdomen. Another male emerged on 22 June. It had been on a stick above water about a couple of days, but remained wet (perhaps the tip of the body touched the water, which spread over its hairy surface). The third specimen was put in formalin for figuring and description. The latter follows:

DESCRIPTION.—*Body* generally of a rather warm sepia tint (but the colour is often hidden, the body being incrustated with mud or decayed bog material): hairy: somewhat cylindrical above, and therefore not so much spread out as some Libellulines. *Length* including appendages some 19 mm.: greatest *breadth* about 5.5 mm. *Head* somewhat pentagonal in shape: transversely about 5 mm.: fairly broad from front to back—about 3.5 mm.: top of head (*epicranium*) convex: *occiput* well developed, hind margin a little concave. *Antennae* of 7 segments, basal two short and swollen, the next slender and about equal in length to the basal two together, the rest slender and sub-equal: hairy. *Eyes*—the spherical part prominent at each fore corner of the head, with a prolongation backwards reaching about one-third across the head. *Labium* (mask) rather short: but just extending beyond the insertion of the fore legs: spoon-shaped: deeply concave: inner surface bearing scattered hairs (or slender spines): submentum narrow: mentum becoming rather suddenly broader: mid lobe finely crenated, with about 13 crenations on each side of the mid point, a minute spine in each depression: mid lobe making a decidedly obtuse angle in front, produced centrally into a blunt point, a short ridge leading up to the point internally: lateral lobes (*palpi*) triangular, concave, distal border with a few (about 7) shallow crenulations and irregularly arranged spines near the margin: inner margin entire; outer margin entire and considerably thickened; *mental setae* in two

* Comstock in his "Introduction to Entomology" (Ithaca, 1920) proposes (p. 179) to restrict the term "nymph" to the immature instars of insects with *gradual* metamorphosis (e.g. grasshoppers), to use the term *naiad* for those with *incomplete* metamorphosis (e.g. dragonflies and mayflies), reserving the terms *larva* and *pupa* for the earlier stages of insects with *complete* metamorphosis (e.g. butterflies and beetles). As there seem to be advantages in this arrangement, I have used the term *naiad* in this article.

series, each consisting of two long slender spines near the outer margin disconnected from the remainder (about 18), which are



ORTHETRUM CERULESCENS, Fabr.

W. J. Lucas, del.

Naiad ($\times 4$); a. Labium ($\times$ about 5); b. moveable hook ($\times$ about 22).

shorter and decreasing in length towards the centre, where they terminate in a cluster of about 12 (so that the mental setae are in all about 40); lateral setae 3 on each side (occasionally perhaps 4)

rising from distinct bases, rather long and slender, subequal (a few smaller spines, irregularly arranged, on the actual margin; in one specimen one on each palp was longer than the rest and might have been taken for a fourth seta had it been in line with the other three); *moveable hook* dark, rather short, somewhat slender, sharp pointed, about one-fourth to one-third the length of the outer margin of the palp. *Prothorax* collar-like, with a fringe of hairs. Combined *meso-* and *meta-thorax* small, hairy. *Mesothoracic spiracles* very pronounced. *Wing-cases* reaching nearly to the distal edge of the fifth abdominal segment. *Legs* rather short, sturdy, hairy; fore about 8 mm. long, mid about 9 mm., hind about 15 mm.; femora and tibiæ about equal; 3-segmented tarsi shorter, the basal two segments in fore and mid legs being short; claws rather long, curved, sharp-pointed. *Abdomen* slightly hairy: broadest about the sixth segment, contracting slightly forwards, gradually tapering to the tip of the appendages behind; subcylindrically arched above, flattened ventrally; colour a fairly uniform brown, the sutures paler; segments subequal in width, except the tenth, which is much narrower; a blunt mid-dorsal spine near the hind margin of segments 4-7 that on 5 being most prominent, surrounded by some longish hairs, continued as a slightly raised smooth space on 8 and 9; small lateral spines on segments 8 and 9. *Dorsal anal appendage* triangular, about as long as segments 9 and 10 together; *male process* fairly prominent; *cerci* just longer than the dorsal appendage; *circoids* about half the length of the cerci; all five appendages sharp-pointed. [Material: two New Forest naiads bred in 1920; one, captured at the same time, preserved in formalin; five other skins found in the New Forest under conditions which left no doubt as to their identity.]*

Of *Cordulia aenea*, Linn. several were seen and one was taken in Alice Holt on 24 May (Stowell); a female was taken at Camberley, Surrey, on 28 May (Green); two females were captured at Abbot's Moss on 31 May and about 7 June (Jackson); and a female was caught at Horsley, Surrey, on 9 June (Lucas).

ÆSCHNIDÆ.—On 22 May a somewhat teneral female *Gomphus vulgatissimus*, Linn. was taken in the New Forest (Lucas). A male *Cordulegaster annulatus*, Latr. was captured in the Forest of Dean in June (Jackson). Near Lymington, Hants, *Brachytron pratense*, Müll. was found to frequent a very boggy birch wood in Roydon Woods: 15 May was the earliest date on which it was seen (Sones). There are two records of *Æschna mixta*, Latr.—a male at Brighton in August (Killington) and a specimen near Lewes in September (Blair). A teneral female of *Æ. juncea*, Linn. was taken at the Byfleet Canal, Surrey, on the occasion of the S. Lond. Ent. and Nat. Hist. Society's Excursion there on 24 July. On 12 Sept. a female *Æ. cyanea*, Müll. was taken at Rainow, Cheshire, in which the

* Dr. E. Rousseau in 'Ann. Ent. Soc. Belgique,' lii (1908), p. 286, has given a description, which in the matter of the labium does not agree entirely with the New Forest examples. He does not give the source of his material.

pterostigma looked rather larger than usual. Both right wings and the left hind one had a cross-vein on the pterostigma (Neave). Such a cross-vein seems to be exceptional, and this example had three. The species was taken at Horsley, Surrey, on 8 Oct. (Blair). On 28 June a naiad was taken at Marlborough Deeps in the New Forest, and from it the same evening a female imago emerged. At 7.20 (s.t.) the thorax was noticed partly out; emergence, however, had but recently commenced. By 7.24 the head and fore legs had emerged, and at 7.25 the mid and hind legs were out. The "rest" then commenced and lasted till 7.59. There was at first during this "rest" a good deal of twitching of legs and lower lip in a somewhat rhythmic manner. During the latter part it became less, the hind and mid legs becoming practically still, fore legs and lip slowing down and becoming still later. During the "rest" the body twitched violently a few times. At the end there was a sudden jerk forwards and speedy extraction of the tip of the abdomen, which was then a little longer than the abdomen of the naiad. The imago—yellowish-green with browner markings—was now hanging to the empty skin. The wings then began to expand from the base, and during most of the time occupied in the expansion there was a slight (or more pronounced) swaying of the abdomen backwards and forwards. By 8.10 the wings had extended till they were about opposite the tip of the abdominal appendages, but the abdomen had apparently also lengthened a little. The extension of the wings was more rapid towards the end of the period. At 8.12 they reached much beyond the tip of the appendages. At 8.15 they were about full length and of a beautiful pale yellowish-green colour. The face had by now turned from green to yellow. The abdomen was arched round the margin of the wings. At 8.23 the wings were flat and becoming slightly transparent. The abdomen extended but slowly: at 8.32 it was contracting and extending slightly, up and down, but the tip of the appendages was still more than half an inch short of the tip of the wings. At 8.45 I had to leave it for about an hour and a half, the abdomen then being not much longer than at 8.32. On my return the abdomen was fully extended. The dragonfly spread its wings in the darkness, and flew off to the window in the morning, the wings then being very glossy.

On 9 June a brown-winged *Æschina* flew by at close quarters near Horsley: it could only have been *Æ. grandis*, Linn. and if a capture had been made it would have constituted an early date for the species (Lucas). It was taken at Delamere in August (Jackson). On 3 Oct. one was seen flying over the Long Water at Hampton Court, Middlesex (Lucas).

CALOPTERYGIDÆ.—*Calopteryx virgo*, Linn. was swarming in Alice Holt on 24 May: "the wood was in parts all alive with them, largely more or less immature" (Stowell). In the New

Forest a very teneral female was caught on 20 May; on 21 May it was frequently seen in teneral condition; by the end of the month it could be obtained of good colour. The species was pretty numerous on 18 and 19 June; on the 22nd it was very common, especially over sunny pools of Blackwater. Twice one was seen with prey which appeared to be *Tortrix viridana*, Linn., but, contrary to the habit of many dragonflies with prey, it was too restless for capture; one secured with prey had caught a sub-imago of the Mayfly *Ephemera danica*, Müll. A male of *C. splendens*, Harris was met with in May at Hampton Waterworks, Middlesex (Blair).

LESTIDÆ.—*Lestes sponsa*, Hans. was taken on Studland Heath, Dorset on 16 Aug. (Stowell), and near Lewes in September (Blair).

AGRIONIDÆ.—*Platycnemis pennipes*, Pall. was well out in the New Forest on 23 June, and usually full coloured: it had clearly been out some days at least. On 30 June it was very common there as well as its whitish form—var. *lactea*, Charp. *Pyrrosoma nymphula*, Sulz. was common at Wicken Fen on 9 May (Lyle); it was taken, somewhat teneral, in the Royal Hort. Soc. Gardens on 8 May (Lucas); by 21 May it had been out some time in Alice Holt (Stowell). In the New Forest one was caught on 10 May in rather teneral condition; on 21 May it was sometimes fairly mature in colour and texture; by the end of the month it could be obtained of good colour. The species was obtained mature as well as teneral on 3 June at Stanmore Common, Middlesex (Lucas). *P. tenellum*, Vill. was captured, teneral, on 21 June in the New Forest; it was very common there on the 30th of the month. An example of the var. *melanogastrum*, Selys was secured in the Forest on 10 Sept. (Lucas). On various occasions and in a number of its known haunts in the New Forest *Ischnura pumilio*, Charp. was sought for in 1920, but without success, and it seems certain that this little dragonfly has disappeared, at any rate for the time being (Lucas). Its congener, *I. elegans*, Lind. was captured at Hatchmere, Cheshire, in August (Jackson); it was met with as late as 14 Sept. near Hythe in the New Forest (Lucas). *Agrion pulchellum*, Lind. is reported from Delamere in June (Jackson). *A. puella*, Linn. was taken at Stanmore Common on 3 June, and at Epsom Common, Surrey, on 11 June (Lucas); at Rainow, Cheshire, on 7 Aug. (Neave). On 21 June both sexes of *A. mercuriale*, Charp. were found at Duck-hole Bog in the New Forest, males being numerous. Most were mature in colouring, and one or two cases of connection *per collum* were noticed. At Oberwater on 30 June males were very common; a few females also were taken. This sex always appears to be less common in this species than the male, but it is possibly because the females are less active. In one female the blue colouring was very deep.

but the markings were normal. On 7 July F. J. Killington sent me for inspection two males with very abnormal markings on the second abdominal segment. In one the two forward horns of the mercury-sign were detached, in the other they had practically disappeared altogether. These, with normal examples, were taken at the River Itchin, Eastleigh, Hants. He reported that the species entirely disappeared after the spell of bad weather (*sc.* in mid August). *Enallagma cyathigerum*, Charp. was taken (mature and teneral) at Stanmore Common on 3 June, and at Epsom Common on 11 June (Lucas); at Studland Heath on 16 Aug. (Stowell); and at Wicken Fen on 15 Aug. (Lyle).

Kingston-on-Thames;
October, 1921.

NOTES ON THE LEPIDOPTERA OF GLEN FENDER, PERTHSHIRE, AND INVERSHIN, SUTHERLANDSHIRE.

BY THE LATE F. G. WHITTLE, F.E.S.

A STAY at Glen Fender in April last was the means of my getting an introduction to *Peronca niveana*. Two of the examples obtained were on pine trunks, where they were conspicuous. One was beaten out of pine. All were in good order. It is curious that, although I gave a lot of attention to the birches, I did not find, either by searching or beating, even one *P. niveana*. I did, however, find a beautiful series of freshly-emerged, well-marked *Lobophora carpinata*.

Acanthopsyche atra ♀ from a pupa obtained on a fence near Blair Atholl, exposed on the sill of my bedroom window and watched several times daily for male visitors, failed to attract, unless visits were paid in the small hours of the morning, which is unlikely.

Zelleria hepariella was beaten out of ash in Glen Tilt on April 26th.

I suppose it often happens during the winter months, when collectors are able to find time to consult old records, that volumes of the 'Entomologist,' 'Intelligencer,' 'Record,' 'Monthly Magazine,' are taken down, and notes made to be put to good use in the ensuing season. Last winter, when so engaged, I came across a note by no less an authority than the late H. T. Stainton on E. C. Buxton's remarkable capture in the valley of the Shin ('E.M.M.,' vol. xx, p. 81). I resolved that I would, if possible, spend a few weeks in that district at the proper time. Early in May I arrived at Invershin for Inveran, just above the junction of the rivers Oykel and Shin. Though I failed to find either of the two great rarities, I did not find my visit unprofitable. Several interesting species occurred in moderate numbers. A

Fumea like *casta*, but larger, quite 15 mm. in wing expanse, was bred from two or three spun-up cases found on a rock. They are, I think there is little doubt, the *Fumea scotica*, Chapman. I searched carefully for cases, but they were scarce; less than half-a-dozen were obtained, all of them on one boulder, from one of which the moth had already emerged.

I was surprised to find *Lobophora viretata* so far north. An example of *Peronea niveana* was found on a rock by the side of the Shin; also *Cydia fractifasciana* on the moor. Near the river bank, among *Arctostaphylos uva ursi*, *Eucosma arbutella* and *E. mygindana* sparingly; *Epiblema nemorivaga* more freely. Some of the *Pyrausta purpuralis* obtained were unusually bright.

On my return home I visited the Natural History Museum, and had the pleasure of an interview with Mr. Durrant. He it was who, always helpful, drew my attention to Buxton's own communication (which I had somehow missed) to the 'Entomologist,' vol. iii, pp. 24, 25, in which further and more precise particulars are given of the capture, in the years 1853 and 1854 respectively, of *Chalybe pyrausta* and *Roslerstammia pronubella* between the upper and lower falls of the Shin.

At Invershin, close to the inn and railway station, some insects of special interest occurred. They were for the most part in small numbers, but the quality was good—*Retinia posticana*, *Laspeyresia cognatana* (well marked and of large size), *Eretria resinella* abundant. I was pleased to breed a very handsome *Cosmophorana* from resin balls gathered for *Resinella*. *Thera cognata* and *T. juniperata* larvæ were beaten from juniper, and with them *Eriocephala aureatella* imagines in some numbers.

[The above notes were written by Mr. Whittle a few days before his death. It is not surprising that he did not meet with the rare Lepidoptera reported by E. C. Buxton from Invershin, supposing that they are still to be found there; for, with respect to *Chalybe pyrausta*, I know he expected to find it amongst its reputed food-plant, *Thalictrum*, but Buxton states that he thought he beat it from blackthorn, *Roslerstammia pronubella*, from beech. Buxton's recollections, written thirteen years afterwards, are probably at fault, for I do not think there is any blackthorn on the banks of the Shin, and I am still more strongly of opinion that beech does not grow there. I presume for beech one should read birch, which is abundant; the only other trees I can recollect there are sawallow and rowan. Mr. Whittle wrote me in May last that he had found a species of *Thalictrum* growing at Invershin, probably *T. alpinum*.—W. G. SHELDON.]

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from vol. xiv. p. 289.)

GEOMETRIDEÆ, GEOMETRINÆ.

(Arranged according to L. B. Prout's classification in Seitz's 'Palearctic Macrolepidoptera.')

Abraxas grossulariata.—A very varied series of 135.

Most of the specimens are wild ones, with the variation tending to an increase of the black coloration, but two specimens from the Meldola Collection, taken in Wigtonshire, are almost quite white. Among the bred specimens are 3 var. *nigro-sparsata*, 6 var. *lacticolor*, and 9 var. *varleyata*.

Angeroma prunaria.—A remarkable specimen of the ab. *corollaria* type from the Meldola Collection labelled "Essex. Chingford," has the usually dark base and outer margins of a pale ochreous colour with a reddish orange central band.

Gonodontis bidentata.—In the long series are 13 ab. *nigra*, Prout, from Yorkshire, and 14 from the Manchester district.

Ourapteryx samiauraria.—A specimen from the Chitty Collection, labelled "E. Woodhay, 1882," is almost pure white. A specimen of a second brood was presented by Mr. J. Collins, taken by him October 3rd, 1921.

Onisthographis luteolata.—A specimen from the Meldola Collection, bred from a Perthshire larva, May 5th, 1912, has both hind wings and the lower half of the left fore wing pure white.

Venitha macularia.—A specimen from the Meldola Collection labelled "Kent, Dartford, June 25, 1872," is almost pure yellow, a few of the normal dark markings being very faintly shown by a pale ochreous colouring.

Macaria liturata.—The series includes 6 specimens of ab. *nigrofulcata*, Collins, 2 from North Staffs, and 4 from Delamere.

Phigulia pedaria.—The series includes many specimens of ab. *extinctaria* and ab. *monacharia*.

Nyssia zonaria.—A long series from Cheshire and Lancs, and 4 from Tiree..

Pareilopsis lapponaria.—A long series of both ♂ and ♀.

Biston betularia.—The long series includes several forms intermediate between the type and ab. *doubledayiaria*.

Boarmia repandata.—Series of over 200.

Ab. *conversaria*, ab. *nigricata* and ab. *scolorensum* are well represented. The restriction of the melanic forms to the North Midland and Northern English Counties is well illustrated.

Cleora arenaria (riduaria).—Series of 7 from the Spilsbury Collection, and 1 from the Sellon Collection.

Boarmia punctinalis (consortaria).—A long series of typical forms, and 12 melanic specimens bred from Sutton Coldfield stock, obtained from L. W. Newman.

Ectropis crepuscularia.—The long series contains many specimens of *ab. delamerensis*, from S. Wales, N. Staffs, Cheshire and Cumberland.

E. bistortata (biundularia).—Twenty melanic specimens from Swansea are included in the series.

E. consonaria.—The series includes 15 melanic specimens bred from larvæ of Rainham stock obtained from L. W. Newman.

Isturgia limbaria.—A long series from the Spilsbury and Chitty Collections without data, 6 from the Meldola Collection labelled "Ipswich, 1895," and 2 from the Pogson Smith Collection labelled "Ross-shire, Achanalt, 6, 91."

Ematurga atomaria.—A long and very varied series. A most remarkable male specimen from the Chitty Collection and labelled "New Forest, 1887," is pure pale yellow without any markings at all.

Itame fulvaria (brunneata).—A long series from Perthshire and Aberdeenshire, and two specimens from North Staffs taken in June, 1920.

Chiasmia clathrata.—A remarkable specimen from the Pogson Smith Collection taken at Nettlebed, Oxon., in August, 1892, has the ground-colour of a uniform chocolate. Towards the outer margin of all four wings are a few small white spots.

ZYGENIDÆ.

Zygena purpuralis.—A long series from N. Wales, Galway and Clare.

Z. achilleæ.—A series of 8 taken near Oban in 1919 by P. C. Reid, Esq., presented by him.

Z. trifolii.—A very long and varied series showing almost every form of variation, including *var. lutescens*, Cockl., from Emsworth, presented by W. M. Christy, Esq.

Z. filipendulæ.—Nine examples of *ab. flava*, Robson, bred by L. W. Newman from Kentish stock.

SESIIDÆ.

Sciapteron tabaniformis.—Three specimens. One from the Hope Collection labelled "Ealing Gardens, 1853." One from the Spilsbury Collection without date. The third from the Sellon Collection labelled "Cummings Collection."

Sesia scoliceformis.—A series of 14 from Rannoch, and a larva taken by myself in Cannock Chase, June 7th, 1920.

S. sphegiformis.—Four specimens bred Berkshire, presented by C. Rippon, Esq. Three from the Sellon Collection labelled "Tilgate Forest," and 10 from North Staffs taken at flowers, June, 1919, by myself.

S. andreniformis.—Series of 11 with full data, all from Kent. Three from the Meldola Collection, 8 presented by B. G. Adams, Esq.

HEPIALIDÆ.

Hepialus humuli.—Included in the series are over 70 specimens of var. *hethlandica*.

(To be continued.)

NOTES ON *VANESSID* LARVÆ.

BY PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N.,
F.L.S., F.E.S.

In the 'Entomologist' for 1864-5, vol. ii, p. 132, Mr. J. R. S. Clifford surmises that the larvæ of *V. urticae* and of the genus *Vanessa* in general are remarkably exempt from the attacks of ichneumons. This is not quite my experience, for since I began collecting—as long ago as 1855—I must have fed up many hundreds of larvæ of *Urtica*, *Io* and *polychloros*, and I generally found that they were more or less infected with parasites. In two instances I remember having had large broods of the larvæ of *polychloros*, and only bred a single butterfly from each lot.

This year, on June 10th, I found a nest of very young larvæ of *V. urticae*. They were spun up among the terminal leaves of a couple of stems of nettle, growing side by side, and almost touching, and appeared to be divided into two little family parties, one of which contained twice as many larvæ as the other. I took the largest lot, which comprised, as far as I could guess, from 150 to 200 larvæ, and left the other. I judged from their size they were about two days old. I had read somewhere that if the larvæ are taken very young they are seldom found to be ichneumonised, and I thought this would be a good opportunity of testing the truth of the statement.

On reaching home I put the larvæ, in their little nest, under a large glass cylinder, with some nettles pulled up by the roots and plunged into a wide-mouthed bottle beneath it. The larvæ grew fast, and in a few days had reduced the leaves near their nest to mere skeletons. By June 20th they were more than half grown, and were in a very healthy-looking condition. On this day I went to the place where I found them on the 10th of the month, to see how those I had left behind were getting on. They appeared to be a trifle larger than those I had at home, had quitted their nest and were scattered about the plant. I took all I could find—just 50—and when I got home they were placed under a separate cylinder. By June 25th they were in their last skins, and were consuming a large quantity of food. In the first cylinder (the one that contained the first lot of larvæ) they were

too crowded, so I divided them into three lots, under separate cylinders. I now had four cylinders on the table in front of my sitting-room window, where I could see and note everything that went on.

On June 29th one or two of the second lot of larvæ, taken on the 20th, suspended themselves from the muslin roof of the cylinder, but others seemed to have some difficulty in doing so, and were evidently suffering from the attacks of parasites. A few had ceased to feed and were resting in a listless humped-up condition on their food-plant. The larvæ in the other cylinders—those taken on June 10th—were all feeding up well and rapidly, and by July 1st had become pupæ. At this date of the second lot of larvæ only seven had changed to pupæ, and the remainder appeared to be stung, and I found several fat white maggots wriggling about on the paper on which the cylinder was standing, and also a number of dark reddish-brown fly pupæ about the size of those of the common house-fly.

The first butterflies emerged on July 14th and by the 18th they had all hatched out as follows :

Seven only from the 50 larvæ taken on June 20th ; the rest were all ichneumonised or died.

Of the 141 larvæ comprising the first lot—taken June 10th—every one produced a butterfly, so this seems to prove that very young larvæ are not attacked by parasites.

On August 1st I found another small brood of larvæ, about half grown, and took 58 of them. This was probably a second brood. By the 12th most of them had changed to pupæ, but there were six or seven white maggots and a few brown fly pupæ lying on the paper beneath the cylinder. The butterflies emerged on August 21st and 22nd, 46 altogether, so only 12 of these larvæ failed to produce imagines. This brood therefore seems to have escaped the attention of parasites to a considerable extent. The larvæ were found in a bed of nettles beneath the shadow of some willow trees, where they were more or less sheltered.

In various countries abroad I found such *Vanessid* larvæ as I attempted to rear on board ship were singularly free from the attacks of parasites. In 1878, when up the Dardanelles in H.M.S. "Cygnet"—during the Russo-Turkish war—the larvæ of *V. antiopa* were abundant on both sides of the Straits throughout May and June. In the neighbourhood of Gallipoli, on June 13th, I noticed a number of full-grown larvæ wandering about the branches of a small willow tree as if they were looking for sheltered positions where they could attach themselves for pupation. I took 30 of the largest, and when I returned to the ship put them into an empty biscuit tin, and tied a piece of muslin over the top. The next morning they were all hanging to the muslin, and by the evening of the 15th had become pupæ. The butterflies emerged on the 26th, and were most magnificent

specimens, the largest I have ever seen. There were no signs of ichneumons.

At Lyttelton, near Christchurch, New Zealand, on January 27th, 1884, I found the larvæ and pupæ of the beautiful *Pyrameis gonerilla*, Fabr., plentiful among nettles in the gullies on the mountain slopes at the back of the town, and took a large number. This stinging-nettle upon which the larvæ were feeding was taller and much more robust and bushy than our common English plant, and its stinging powers about twice as severe. The habits of the larvæ were much the same as those of *P. atalanta*, as was also their general appearance. I also caught three fresh butterflies, evidently just emerged, and observed worn females engaged egg-laying, so there was probably a succession of broods during the summer. Subsequently a number of the perfect insects were bred, and I did not find that any of the larvæ or pupæ had been attacked by parasites. On March 9th, 1883, the first time I ever saw *P. gonerilla* alive, I took three fine specimens in the Botanical Gardens, Wellington, where I found them feasting on the sweet-smelling flowers of a kind of privet. It is a beautiful insect when seen with its wings fully expanded in the bright sun.

The larvæ of *Pyrameis uca*, Fabr., were very common at Hobart, Tasmania, in February, 1883, and I took a number from beds of nettles in various parts of the town and its outskirts, and bred many of the butterflies, but did not notice any sign of ichneumons. It also occurred in Australia, where I saw larvæ commonly in the neighbourhood of Sydney, as well as at Blackheath, on the Blue Mountains, in February, 1885.

Another *Faustul*, *Junonia voluda*, Fabr., was common in Australia, and upon all the islands in the Pacific that I visited. Its habits much resemble those of *A. urtica*. Near Sydney I found the larvæ feeding on *Plantago major* and *P. lanceolata*, as well as upon *Antirrhinum*, in the Botanical Gardens. At the Friendly Islands they fed on sweet potato and on other islands they were to be met with feeding, quite exposed, on the leaves of a kind of *Daphne*. I bred a large number of the butterflies, but did not notice that any of the larvæ or pupæ were "stung."

Dovercourt;

November 23rd, 1921.

NOTES AND OBSERVATIONS.

CORRECTION OF A GENERIC NAME.—In my 'Exotic Microlepidoptera,' vol. ii. p. 456, issued in November, 1921, I described a new genus of *Cosmopteropidae* under the name *Mathonicea*, unaccountably forgetting Lord Walsingham's use of the same name for a genus of *Xylorhynchidae* (probably a synonym of *Stenoma*). I now propose to substitute for my genus the name *Mathumodes*.—E. MEYRICK: Thornhanger, Marlborough, November 24th.

NEW NAME FOR A FOSSIL TIPULID FLY.—By an unfortunate oversight I have given the name *Dicranomyia excavata* to a Gurnet Bay fossil in 'Ann. and Mag. Nat. Hist.,' June, 1921, p. 458, when the same name had been applied to a different species in 'Entomologist,' May, 1921. The later (June), *D. excavata*, may be renamed *D. exhumata*, n.n.—T. D. A. COCKERELL.

PIERIS RAPÆ, L., IN DECEMBER.—My daughter, Miss G. M. Haines, brought in, yesterday afternoon, a specimen of *Pieris rapæ*, L., which she found settled on a blade of grass in this village. The specimen is a very small male and appears newly emerged. It is somewhat more strongly marked than the paler specimens of the usual spring brood, but much more lightly than normal summer specimens. The apical blotch of the fore wings is quite distinct, but palish, as in the rather faint central spot. A very pale, rather linear suffusion is present before the apex on the costal border of the hind wings. The weather is still very mild, and the insect might represent, after such a phenomenal season, a fourth brood of the species!—F. H. HAINES; Brookside, Winfrith, Dorset, December 9th, 1921.

COLIAS EDUSA AND SOME OTHER SPECIES AT EASTBOURNE.—All through the past glorious summer, with its brilliant sunshine and undue share of easterly and south-easterly gentle breezes, we have been on the look-out for *Colias edusa*, but it was not until so late a date as October 26th that it came under our notice. On that morning, as I strolled on the Parade between 9 and 10 o'clock, I noticed a yellow butterfly feasting at a blossom of red valerian, and on approaching nearer to it found that it was without doubt *edusa*, but before I had time to examine it closely it flew up over the top of the bank and away inland, but from the glance that I got I judged it to be somewhat faded in colour. An hour or two later on the same morning I came upon another some mile or so further along the coast in one of the hollows under the Downs. This I was able to examine carefully and found it to be a female, without a chip in its wings, but undoubtedly much faded as though it had travelled a considerable distance. Although the weather continued fine for nearly a fortnight longer no other specimens of this species were seen. Other species that frequent our sea-front and its adjacent gardens have been remarkable rather for the late dates to which some of them have lingered with us than for their abundance at any time during the summer. Of the Vanessids, for instance, *Pyrameis (Cynthia) cardui* was first seen on July 1st, but not again until September 25th, from which date it occurred sparingly until the last week in October, when it became quite numerous for a few days, the last, a single individual, being met with on November 7th. *Pyrameis atalanta* was noted on July 30th, a single specimen, then from the end of September until October 30th, when it was last seen, was of almost daily occurrence, but only to the extent of some two or three individuals in a day. It appears to have been somewhat commoner a few miles inland, and I may mention in passing that when I was at Latchford, on the Cheshire border, on September 3rd it was there very abundant, a score or more frequently feeding at the blossoms of a *Buddleia*, of which shrub several fine specimens were growing in the garden that I was

visiting. *Aglais urticae* has been quite a rarity. *Pieris brassicae* was at no time sufficiently common to cause any serious anxiety as to our cabbages, and *P. rapae*, although for a week or so towards the end of July looking like becoming too numerous, soon died down, and had disappeared altogether by October 10th. *Pararge megæra* has thrown three fairly well-defined broods, the first appearing on May 2nd and continuing throughout that month. The second and most numerous was out from July 22nd until about August 20th, and a small third brood from September 29th to October 7th, which was the last date on which the species was noted. *Chrysothamnus phleus* has produced certainly three and possibly four broods during the season. From May 1st to 16th it was frequently met with; then came a gap until July 3rd, from which date to the end of the month it was common. A few were seen about the middle of August, but whether stragglers from the earlier brood or a small third one it is difficult to say, but from September 29th to October 11th it was again common. Three or four species should, however, be mentioned on account of their great abundance. Round about the end of May and first week or so in June *Cepido minimus* occurred in greater numbers and over a wider area than I have before met with that species, even invading the Parades and our gardens. In the middle of July *Epanephele partina* rose from the long grass of the hollows of the Downs in numbers in the evening at every step as one walked through it, and at the same time practically every knapweed head was seething with *Zerene philonotus*, a single head frequently having half a dozen individuals upon it. During the latter half of October *Plusia gamma*, which species by the way had been fairly common in June, suddenly became very abundant about the middle of October, swarming about the red valerian blossoms in vast numbers both by day and night, and so continued until the end of the month. It was last seen out of doors on November 7th, but an individual insisted upon buzzing about the house as soon as the lights were turned on until the evening of the 10th.—ROBERT ADKIN; Eastbourne, December, 1921.

COLIAS HYALE IN KENT AND C. EDUSA IN DORSET.—*C. hyale* was common this year in the Ashford district, notably more so than at Folkestone. The insect favoured lucerne fields in preference to clover, especially in spots where it was protected from a rather cold south-east wind which was blowing during the month of August. My first specimens were taken on July 31st, and the last on August 26th. White females were fairly common, especially towards the end of August. *C. edusa* was conspicuous for its absence. The latter, however, was fairly abundant at Weymouth during the first fortnight in October. I believed many of these to have belonged to a second brood.—E. SCOTT, M.B.; Hayesbank, Ashford, Kent.

PYRAMEIS CARDUI IN NORTH LANCASHIRE AND WESTMORLAND.—The following occurrences of *Pyrameis cardui* may possibly be worth recording as I have not seen the species before in the following localities: High Carley, near Ulverston, Lancashire—a female—September 19th, 1921. Another specimen at Elswick, in the Fylde, September, 1921. Two specimens in a garden at Bowness-on-

Windermere, Westmorland, September 18th, 1921.—G. LISSANT COX ; Preston.

THIRD BROOD OF PARARGE MEGERA AND COLIAS EDUSA IN HANTS.—With reference to the Rev. Gilbert H. Raynor's remarks ('Entom.', vol. liv, p. 269) on the third brood of this species, I should like to place on record its occurrence as late as the last week of October and first of November on low cliffs facing the sea, between Milford-on-Sea and the Hurst Castle marshes, South Hants, in prime condition, of normal size, very active and elusive on the wing, and hardly resting for a moment. At the same time and place *Colias edusa* was likewise to be seen, with, however, somewhat changed methods of flight, fluttering, uncertainly and weakly, round bramble and other bushes, and could have been captured without any exertion or trouble. The specimens were equally fine. At Milford the weather conditions of this very remarkable autumn were abnormally mild and summerlike till November 7th, when, after a sudden furious storm of wind and rain, cold weather suddenly set in, with deep snow in some places and keen frost throughout England.—I. COSMO MELVILL ; Meole Brace Hall, Shrewsbury.

SECOND BROODS OF NISONIADES TAGES AND CUPIDO MINIMUS.—Numerous examples of *Nisoniades (Thanaos) tages* were observed on the Downs here during the last few days of July. So far as my own observations were concerned I could not see that these specimens were in any way different from the normal spring ones. *Cupido (Zizera) minimus* occurred at the same time and place in abundance, although the early June emergence was quite scarce.—A. T. POSTANS ; 148, Fawcett Road, Portsmouth.

LARVÆ OF SPHINX CONVULVULI IN HANTS.—On October 25th, whilst pulling mangolds in a field nearby, the worker found two larvæ which he brought to me, and which proved to be *S. convulvuli*. The field was searched over on subsequent days but *Convolvulus arvensis* was very scarce. On November 4th one other larva was found. Further search was not successful, and doubtless the cold weather and snow of the nights of the 7th and 8th destroyed both any other larvæ there may have been and what little remained of the withering food-plant. Each of the three larvæ is of a dark muddy sepia brown ground-colour, inconspicuously and minutely mottled with yellow dots. The face mask is blackish with three yellow stripes on either side with a shorter sub-triangular central stripe. There is a more or less conspicuous yellow sub-dorsal stripe on each side extending from the head to the fifth segment. From that point its position is indicated by a yellowish spot on the anterior portion of each segment from the sixth to the eleventh. These spots are not connected by any intermediate stripe. Below the spiracles, which are blackish in colour, there is an interrupted continuous bold whitish subspiracular line throughout the whole length. This line extends round the anal flap, at which point it is more yellow in colour. There are distinct oblique blackish side stripes on segments 5 to 11 and indications of a dorsal stripe on segments 2 and 3. The horn is black and shiny. The ventral area, legs and prolegs are dark, slightly shagreened with yellowish. When at rest the larva lies half curled with head parallel

to the 10th or 11th segment. The length of the two larvæ first found was about $3\frac{1}{2}$ in. The third larva was slightly smaller. This description of the larva when compared with the plate in Kirby's 'European Butterflies and Moths' does not give the impression that his illustration is true to life. It may be that the larva assumes the magnificent appearance as shown in the plate when fully grown, and that the larvæ found by me have yet to cast their skins for a final time. It agrees, however, well with the plate in Buckler's 'Larvæ,' vol. ii, except that the larvæ all showed a marked melanic tendency in harmony with the dark soil of the field where they were found. In years gone by *S. convolvuli* not infrequently was to be seen hovering over a bed of *Nicotiana affinis* in my garden, but this year no specimen was seen. — ALAN DRUITT; Willow Lodge, Christchurch.

Since writing this note two of the larvæ have died. The third has been preserved as a cabinet specimen. — A. D.

DEIOPEIA PULCHELLA AND STERRHA SACRARIA AT LULWORTH. — I wish to record my capture on October 11th of a fine fresh female specimen of *D. pulchella* and a fine fresh male specimen of *S. sacraria* on the cliffs near Lulworth. The moths were taken within a few yards of one another. It was a cold day and there was a strong breeze blowing from the sea. On this account I presume that they were likely to be migrants. — E. SCOTT, M.B.; Hayesbank, Ashford, Kent.

ORRHODIA ERYTHROCEPHALA, ETC., NEAR EASTBOURNE. — This species turned up again on October 29th on the same sugaring round and within about forty yards of the spot where I took one in November, 1913. It is the *glabra* form and in very good condition. I have tried twice since but the evenings were unsuitable. Ivy bloom has been the best method of collecting here this autumn. Although insects were not at all numerous the first week in October I took twelve *Xanthopan semibrunnea*, two on the 1st, one on the 5th, and on the 4th, 6th and 8th three each evening, all in fine condition. The bloom was nearly over when I went with a friend on the 10th, but on the only clump we were able to search before a heavy storm drove us home the insects were far more numerous than on any previous occasion, but I am still waiting for the evening when "every bunch of blossom has three or four occupants." — EDWIN P. SHARP; 1, Bedfordwell Road, Eastbourne.

ORRHODIA ERYTHROCEPHALA GLABRA AT EASTBOURNE. — At the suggestion of Mr. E. P. Sharp I am writing to inform you that I was fortunate enough to capture a specimen of *Orrhodia erythrocephala* ab. *glabra* at sugar on November 24th within a short distance of the spot where Mr. Sharp made his capture. — S. A. CHARTRES; 4, King's Drive, Eastbourne, December 14th, 1921.

ACONTIA LUCTUOSA AT SUGAR. — In glancing through my entomological diary for the past season, I am reminded of a somewhat phenomenal occurrence which I thought might be worth recording in the 'Entomologist.' This was the capture of two examples of *A. luctuosa* from sugar patches quite late in the evening, viz. 10 p.m. The exact date was July 27th, the evening of which was not a

particularly favourable one for sugaring in consequence of the exposed situation chosen (a row of posts on an almost bare hillside), and upon which the rays of an almost full moon were directed. One of the moths taken flew off from the sugar as I approached and the net had to be brought into action for its capture. The thought has occurred to me that possibly the bright moonlight may have been in some way responsible for the late activities of this usually sun-loving species. It would be interesting to know if other readers have observed this unusual habit in *luctuosa*.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

THALPOCHARES (MICRA) PARVA.—Whilst searching ivy here at 9 p.m. on November 1st, 1921, I took a good specimen of *T. parva* at rest on an ivy leaf immediately below an ivy bloom on which it had most probably fed. It sat with wings depressed after the fashion of *Pionea forficatalis* and *Margarodes unionalis*, and was very active when the "closure" was applied. Mr. J. W. Metcalfe, with his usual kindness, has verified my capture. Several *Noctua* were observed taking long and rapid flights in the bright October sunshine. Most of them appeared to be *Agrotids*, but one that was netted proved to be a male *Aporophyla nigra*. Autumn "sugar" was a failure.—P. P. MILMAN; Cyprina, Lower Conway Road, Paignton.

NOTES ON BUTTERFLIES FROM THE BUCKS CHILTERNs, 1921.—Generally speaking butterflies were abundant on the hills. The spring broods all appeared early, and were perhaps only normal in numbers, but the unbroken hot dry weather from May to July was favourable to larvæ, etc., and second and third broods of some species were very plentiful. I saw no evidence of scarcity of food-plants adversely affecting any species; the chief effect of the drought seemed to be the unusual rapidity with which insects became worn. It was difficult to get "cabinet" specimens a fortnight after emergence—such was my experience, at any rate. The following notes on certain species from one area may be of interest: *Pieris rapæ*, perfectly fresh specimens taken in September suggest a third emergence. *Gonepteryx rhamni* (July 14th), *Vanessa io* (July 11th), *Aglais urticæ* (July 3rd), *Pyrameis atalanta* (July 3rd), a fair number about for two or three weeks subsequent to these dates, then altogether disappeared. *P. cardui*, only worn insects seen, early in July. *Dryas paphia*, first seen June 26th, fairly common in several woods. *Brenthis euphrosyne*, common and well distributed. *Melanargia galatea*, emerged about June 22nd, abundant in certain localities. *Pararge megæra*, fairly common in May and August though rather local. *P. egeria*, var. *egerides*, four broods occurred, and the butterfly was common in most woods all the season. Emergences approximately as follows: (1) middle of April, (2) June 10th, (3) July 25th, (4) first week in September. The females of the spring brood are an unusually yellow form, I think. Fourth brood males very dark; one taken has all yellow obsolete except for two small spots towards tip of fore wings. *Zephyrus quercus*, *Thecla w-album*, very local. *Chrysophanus phlaeas*, spring brood rather scarce, second and third plentiful. The last emerged early in September. *Polyommatus icarus*, three emergences, May 12th, July 16th and September 1st.

Second and third broods abundant, var. *carulea* frequent. Females of last brood often very dark. *Cupido minimus*, emerged May 12th. Plentiful in many places: a partial second brood in August. *Celastrina argiolus*, very scarce in the spring, and by no means common in July and August. *Agrotides corydon*, emerged about July 20th. Not so plentiful as might have been expected this summer: females mostly typical. *Nemeobius lucina*, very local.—S. B. HODGSON; 3, Bassett Road, North Kensington, W.

LEPIDOPTERA TAKEN OR BRED FROM LARVÆ AND PUPÆ FOUND IN THE GARDEN AT 3, LITTLE DEAN'S YARD, WESTMINSTER.—Said garden measures about 84 feet by 36 feet. Rhopalocera: *Pieris brassicæ*, *Pieris rapæ*. Heterocera: *Dilma* (Mimas) *tiliæ*, *Phalera bucephala*, *Orgyia antiqua*, *Spilosoma menthastri*, *Spilosoma lubricipeda*, *Aeronautes psi*, *Noctua primuliæ*, *Aryllia putris*, *Triphæna* (*Agrotis*) *comes*, *Triphæna* (*Agrotis*) *pronuba*, *Barathra brassicæ*, *Mamestra oleraceæ*, *Eupleria lucipara*, *Phlogophora meticulosa*, *Mormo maura*, *Nenia typica*, *Caradrina taracaci*, *Caradrina quadripunctata*, *Amphipyra pyramidea*, *Calymnia affinis*, *Amathes* (*Orthosia*) *lota*, *Plusia gamma*, *Abrastola triplasia*. *Xanthorhoe fluctuata*, *Eupithecia oblongata*, *Eupithecia vulgata*, *Abraxas grossulariata*, *Ennomos quercinaria*, *Selenia bilunaria*, var. *juliana*, *Oura-ptyx sambucaria*, *Hybernia defoliaria*, *Lycia hirtaria*, *Hemerophila* (*Synopsis*) *abruptaria*, *Beamia rhomboidaria*.—(Rev.) A. G. S. RAYNOR, 3, Little Dean's Yard, Westminster.

A FORTNIGHT IN CARNARVONSHIRE.—We—that is, my friend Mr. E. D. Bostock and myself—started on September 1st for a fortnight's pursuit of Lepidoptera at Abersoch, a village on the coast seven miles west of Pwllheli. The first object of our expedition was to search for the larvæ of *Dianthæcia barretti*, the imago of which I had taken there in 1897 and 1899 ('Entom.' vols. xxx and xxxii), but though we examined hundreds of plants of *Silene maritima* not a trace of the larva could we find. During the first week the weather was warm and sunny, and butterflies were numerous. *Pieris brassicæ* and *P. rapæ* were common, and *Pyramis atalanta* abundant on the purple flowers of a large species of Veronica. *P. cardui* also was fairly common, but seemed to prefer the flowers of heather to the Veronica, though it visited both. *Vanessa urticæ* in fair numbers was in good condition, possibly a third brood. Worn specimens of the second brood of *Lycæna icarus* were numerous on the sandhills, where were also many *Canonympha pamphilus*, some in quite fresh condition, and a third brood of *Chrysophanus phlæas* was beginning to appear. Five specimens of *Colias edusa* were seen, but their flight was too rapid for capture. On the sandhills at Port Nigel, which we visited one day, we found a few specimens in fair condition of a second brood of *Brenthis selene*, and saw a worn female of *Argynnis aglaia*. On the sandhills at Abersoch there were a few wooden posts still standing, the remains of what had once been a fence enclosing a large square. On these we put sugar every night, and to it moths came freely. The most abundant visitors were *Agrotis vestigialis*, *Noctua xanthographa* and *Phlogophora meticulosa*, and in smaller numbers were *Agrotis segetum*, *A. exclamantis* and *A. upsilon*,

Noctua glareosa, *N. c-nigrum* and *N. plecta*, *Triphæna pronuba* and *T. comes*, *Xylophasia monoglyphæ*, *Leucania littoralis* (these last evidently from their condition and small size a second brood), and *Apamea secalis*. Occasional visitors were *Stilbia anomala*, *Hyphenodes costæstrigalis*, *Aporophyla lichenea*, *A. nigra* and *A. lunosa*. On September 8th *A. lutulenta* appeared, and continued to come in increasing numbers until the day of our departure (September 15th), and altogether we took over thirty specimens. None of them were of the ordinary English brown form, but all were ab. *luneburgensis* or ab. *sedii*. The occurrence in this locality of these forms of *A. lutulenta*, of *D. barrettii* of the brown Howth form, together with that of the *Zygæna pilosellæ*, is extremely interesting. The abnormality of the season is well shown by the second broods of three species usually only single-brooded on this side of the English Channel, namely *B. selene*, *A. exclamationis* and *L. littoralis*.—F.C. WOODFORDE; Oxford.

CRICKETS AND REFUSE DUMPS.—With reference to Mr. Campion's note (p. 246), I can put on record that last autumn crickets were plentiful and very noisy about 3 p.m. on two Saturday afternoons on the edge of a large dump between Kew and Mortlake. I have not come across my notes on the occurrence, so cannot just now say the exact dates, but I see from my pocket diary that I passed the spot on October 2nd and 9th, and again on November 6th and 20th. Probably the two former dates would be the ones. November 20th was at the beginning of the cold spell we had last winter, so can be ruled out. The dump faced south, and was composed of household refuse, ashes and old tins, flanked by a mass of old cabbage and Brussels sprouts stalks, amongst which were the crickets. Then, again, on October 1st this year, near Grays, Essex, we found crickets plentiful on the sea-wall between the stones, and further on the edge of a refuse dump, mostly ashes. Both these dumps were smouldering in places, so there would be extra temperature beyond that derived from the sun's rays, this being similar to the case mentioned by Mr. Campion.—H. J. BURKILL; 79, Cornhill, E.C. 3.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—November 16th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The Secretary announced that the Council had nominated the following Officers and Council for 1922: President: The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc. Treasurer: W. G. Sheldon, F.Z.S. Secretaries: Messrs. S. A. Neave, M.A., D.Sc., F.Z.S., H. Eltringham, M.A., D.Sc., F.Z.S. Librarian: H. J. Turner. Council: Messrs. Robert Adkin, H. E. Andrewes, Ernest C. Bedwell, James E. Collin, F.Z.S., J. Davidson, D.Sc., F.L.S., J. J. Joicey, F.L.S., F.Z.S., F.R.G.S., etc., Frederick Laing, William G. F. Nelson, Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc., Norman Denbigh Riley, H. Rowland-Brown, M.A., J. Waterston, D.Sc., B.D. After some discussion, it was decided to hold an informal meeting on January 4th, 1922, at 5.30 to 7.30 p.m.—*Exhibits*: Mr. W. J. Kaye,

a new race of the Ithomiine butterfly *Dircenna lenea*, from Trinidad, with a series of the typical forms from the Potaro district of British Guiana.—Mr. A. W. Bacot, enlarged microphotographs of the eggs of bed bugs.—Mr. W. G. Sheldon, Lepidoptera from Sutherlandshire.—Dr. A. E. Cockayne, an example of *Pyrausta atalanta* with larval head.—Prof. E. B. Poulton, F.R.S., discussed the question of fluorescence as evidence for the evolution of the pigments of mimetic females from those of their non-mimetic males, and said that with the help of Dr. Cockayne, he had been able to examine for fluorescence the Nairobi forms of *Papilio dardanus* that had been shown by Canon StA. Rogers at the last meeting.—Mr. H. Donisthorpe, specimens of the Chalcid, *Spalangia erythromera*, together with its Dipterous host, and the ant *Acanthomyops fuliginosus* in the nest of which these insects live.—Dr. Neave read a translation from the German of an amusing skit on modern systems of zoological nomenclature.

December 7th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The Secretary again read the list of nominations of officers and council for the ensuing year, and said that he had not received any alternative names.—The following were elected Fellows of the Society: Messrs. W. Bevan Whitney, B.Sc., A.M.Inst.C.E., "Glen Doone," Gerrards Cross, Bucks.; Edward Novill Wilmer, Trafford Hall, near Chester, and Corpus Christi College, Oxford; and John Glover Hugo Frew, M.Sc., 262, Church Road, Yardley, Birmingham, and Rothamsted Experimental Station, Harpenden.—The Secretary expressed the hope that the informal meeting to be held on January 4th, 1922, between 5.30–7.30 p.m., would be well attended, and said that Dr. Cockayne had kindly offered to show the effect of fluorescence on butterflies—an exhibit which would be of great interest to Fellows.—Prof. H. Maxwell-Lefroy, on behalf of Dr. A. Moore, a new method of preserving insects.—Mr. G. Talbot discussed the existence in Africa of a remarkable *Papilio* of the *antimachus* group, and also exhibited, on behalf of Mr. J. J. Joicey, a gynandromorphous example of *Argynnis hyperbias eustasi*.—Mr. R. Adkin brought for exhibition a series of *Aglais urticae*; this exhibit gave rise to some discussion on the comparative rarity of *A. urticae* in 1921, and on the relative abundance and apparent spread in the South of England of *Vanessa c-album*.—Mr. W. J. Kaye, *Heliconius* from Trinidad, and a remarkable Erycinid, *Nymphidium maracalica*, with its supposed model, *Adelipha iphiela*.—Prof. Poulton, black varieties of the Longicorn beetle, *Gramoptera analls*, on behalf of Mr. Joseph Collins; he also gave an account of some observations of Mr. A. H. Hamm on the third brood of *Heodes phloas* from the Newbury district in 1921, and exhibited the specimens referred to.—Mr. R. Stenton, some living Mantids bred from an egg-case taken by Mr. J. C. F. Fryer on an imported Japanese maple.—The following papers were read: "Descriptions of South American Micro-Lepidoptera," by Mr. E. Meyrick, B.A., F.R.S., F.Z.S. "Notes on Orthoptera in the British Museum; Group II, *Calliptamini*," by Mr. B. Uvarov.—Mr. C. Nicholson read some notes on *Vespa*, and on a remarkable nest of *Vespa vulgaris*, illustrated with lantern-slides.

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THE GENUS "*AMBLYPODIA*" *AUCTORUM* (DE NICEVILLE, MOORE, SWINHOE, ETC.), NEC HORSFIELD (LEP. RHOP.).

BY N. D. RILEY, F.E.S., F.Z.S.

THE generic name *Amblypodia* was proposed by Horsfield ('Cat. Lep.,' E.I.C., p. 98, 1829) for a large number of species of *Lycænidae*, divided into five sections. viz.: (1) *Narada*; (2) *virarna*; (3) *apidanus*, *centaurus*, *helus*, *eumolphus*; (4) *phocides*; (5) *vulcanus*, *lohita*, *syama* and some others. On p. 111 of the same work he states that he considers the species of the third section to be typical of the genus. The type of the genus must therefore be one of the species included in the third section, and Boisduval's action in 1870, specifying *narada* as the type, cannot be accepted. The type was finally fixed by Scudder in 1875, who specified *apidanus* as the type. His action was perfectly correct, and must be upheld. *Amblypodia* must therefore supersede *Arhopala* as at present used, and I propose the name *Horsfieldia*, n.n., to replace the *Amblypodia* of modern authors, with *narada*, Horsf., as the type of the genus.

Since the appearance of Bethune-Baker's excellent 'Monograph of the *Amblypodia* Group' little has been done with this rather obscure genus. The life-history of one of the species (*H. anita*, Hew.) has been admirably described by T. R. Bell in the 'Journal of the Bombay Nat. Hist. Soc.,' xxvi, p. 444, and that of the other (*H. narada*, Horsf.) less fully by Snellen in 'Rhop. Java, *Lycænidae*,' p. 63, 1918; and the various races of the species hopelessly confused by Frühstorfer in a paper in the 'Ent. Zeits.' (Stuttgart), xxi, p. 150, 1907.

As the latter paper is very misleading and also very little known, the following summary of the species and their named forms would appear to be necessary.

The genus, so far as is known, is composed of three species, separated as follows:

Males.

- A. Upper side fore wing, purple with a narrow even black border *anita*.
- B. Upper side fore wing, brilliant blue.
 - a. Black border narrow on costa and posterior portion of hind margin, broad at apex *narada*.

- b.* Black border very broad, occupying more than half the wing surface.
- a'.* Lower teeth at extremity of clasper strong, well separated, the ventral edge of clasper concave centrally *narada.*
- b'.* Same teeth small, close together, ventral edge of clasper nowhere concave *annetta.*

Females.

- a.* With blue (or purple) markings on fore wing only, or none at all *anita.*
- b.* With blue (or purple) markings on both wings.
- a.* The outer edge of blue on fore wing conforming to the contour of the hind margin, or, if not, then only of small extent *anita.*
- b.* Outer edge converging markedly with hind margin towards inner angle; if only of small extent then very much longer posteriorly than anteriorly *narada.*
- c.* The blue of approximately the same extent on both wings, barely extending more than half-way from base to hind margin *annetta.*

The males in this genus fall very readily into three well-defined groups, according to their genitalia. Individual variation of these parts, however, is considerable, and seasonal variation seems also to occur; in a typical "wet" male from Ceylon the teeth at the extremity of the claspers are not nearly so strongly developed as are those of a "dry" male, with red underside, from the same locality. The claspers in all three species are only strongly chitinated outwardly, ventrally and towards the base for a short distance from the extremity, the bulk of the inner and dorsal surfaces being only membranous. In all three the distal edge is characterised by having two large teeth, one above the other, and a series of smaller ones above these. *Anita* and *annetta* are very similar as to the arrangement of these teeth, but *annetta* has the lower two the more delicate, shorter in relation to the length of the whole clasper, and with the lowest arising sooner than in *anita*, the remainder not directed upwards to such an extent. *Narada* is separable at once from either of the others by the size and different arrangement of these two main teeth, and by the constriction of the clasper about the middle.

(1) *HORSFIELDIA ANITA*, Hew.

This species is only poorly and somewhat doubtfully separable into local races, the differentiation of which is not very advanced.

(a) *H. anita naradoides*, Moore.

Confined to Ceylon. Although I have examined some forty examples of this race, I cannot find any definite character on which to separate it from Indian specimens. It is, however, on the average considerably larger and somewhat darker. The typical female has a large blue (or purple) patch on the fore wing, and occasionally a trace of blue about the bases of veins 3 and 4 on the hind wing above; the ♀-f. *darana*, Moore, has the blue area replaced by a brown of markedly lighter shade than the rest of the wing, and occasionally a little blue scaling centrally in area 1 *a* of fore wing above.

(b) *H. anita anita*, Hew.

Amblypodia narada dina, Frühst., op. cit., p. 150.

Amblypodia arracana, Grose-Smith, A.M.N.H. (5), xx, p. 268.

Amblypodia narađa, Swinhoe, Lep. Ind., viii, p. 136.

Extends from the Nilgiris to Khandala and across to Bengal, Darjeeling, Assam, Burma and Siam, and possibly to Malacca.

Hewitson's type is a small, bright purple specimen, with a moderate black border and a red underside; it came from Siam. One example in the British Museum from Darjeeling (Elwes Coll.) agrees remarkably well with the description of *arracana*. Burmese specimens are usually very pale above and below, and have only a very narrow black border on the upperside; they have an extremely "dry" appearance. Specimens from Madras and the Nilgiris have markedly pale cilia, the males rather pale above, pale reddish buff below, the females generally very light. From Kanara specimens are usually small, rather dark, the black border in the male comparatively broad; the females similar to *naradoides*, or the blue may be entirely absent or very much reduced.

Should these slight differences prove to be constant in their respective areas (which hardly seems probable), then *dina* should be restricted to the race from Madras and the Nilgiris, *arracana* be applied to the Darjeeling and Assam race, *anita* to the Siam and Malay Peninsula form, leaving the Kanara and Burmese races to be named.

(c) *H. anita orla*, Frühst.

The Javan race. Frühstorfer bases his description on four females. He confuses *anita* and *narada* throughout, and the description might apply to either; but since he separates it from typical *narada* (described from Java), the probability is that it refers to *anita*. A pair in the British Museum are characterised by their very dark and uniform undersides, the diagonal "mid-

rib" line being almost entirely obscured in the male, faintly present in the female.

(d) *H. anita andamanica*, ssp. nov.

Readily distinguished from *A. anita* in the male by the more bluish coloration of the upperside and the very dark underside; in the female by the larger bright blue area of the fore wing and the repetition of the same colour over a large area centrally on the hind wing. On the underside of the female there seem to be no distinguishing features.

B.M. Types No. Rh. 201 ♂, 202 ♀, Andamans (ex Hewitson Coll.).

Confined to the Andamans.

This race has been variously regarded as *erichsoni*, *narada* or *anita* by different authors. The genitalia of the male prove it to belong to *anita*.

(e) *H. anita hainana*, Crowley.

The largest and most brilliant race of *anita*, only known from the type specimen in the British Museum. The genitalia prove it to belong to *anita*.

(2) *HORSTIELDIA NARADA*, HORSF.

(a) *H. n. taooana*, Moore.

The upperside in the male is very brilliant blue, and the black marginal band is about 2 mm. wide at the inner angle, 5 mm. in area 5. The underside varies from reddish to dark purplish brown.

Occurs in Burmah and Tennasserim, Malacca and E. Sumatra.

(b) *H. n. jara*, Fruhst.

Fruhstorfer describes this as "larger, with rounder wings than Javan examples, male of a more intense and brilliant blue than in *narada* [probably *narada narada* intended], female darker than *anita* from Palrang" [? *narada taooana* intended]. Underside darker than in examples from the mainland and Java, with two prominently displayed whitish-grey submarginal bands on the hind wing." He then goes on to say that it occurs in two seasonal forms, one "with a violet suffusion and yellow-brown underside from N.E. Sumatra, dry season"; the other almost "sage-blue," whatever colour that may be, and violet-brown underside. What I assume to be the latter is the only form I have seen. It comes from Nias, and also apparently from W. Sumatra.

(c) *H. n. narada*, Horsf.

This is the smallest and least brilliant race, and is confined to Java. The black border in the male is not nearly so narrowed posteriorly as in the preceding subspecies, and is more even. The female type has the blue scaling on the hind wing extending in the form of rays along veins 2, 3 and 4 right to the margin.

(d) *H. n. salvia*, Frühst.

Described from N. Borneo. Frühstorfer describes it as having a much narrower black distal border to the fore wing than the preceding. The reverse is the case in all the specimens I have examined, but the inner edge of this border is a great deal more diffuse than in the subspecies mentioned so far, and the underside is very dull and uniform, even the hind wing submarginal bands being hardly discernible. Only known from N. Borneo.

(e) *H. n. erichsoni*, Felder.

Very similar to *salvia*, Frühst., above, but far less uniform on the underside. Of the two distal grey bands on the hind wing below, the inner is by far the more conspicuous. Originally described from Luzon, and said by Frühstorfer to come also from Palawan and Basilan; I have only seen it from Luzon.

(f) *H. n. plateni*, ssp. nov.

♂. Differs from all the preceding races in that the distal black border occupies the whole of the area from costa to upper edge of cell, the whole of the apical area, areas 4 and 5 with the exception of a few scattered scales proximally, more than half of area 3, rather less than half of area 2, and is 3 mm. wide at its narrowest point in area 1b. In effect the border appears to occupy practically the whole of the distal half of the wing. On the hind wing the blue does not extend into area 6 at all. Underside dark, greenish, markings as in *erichsonii*.

B.M. Type No. Rh. 203, ♂; Davao, S.E. Mindanao (*Dr. Platen*), ex Godman & Salvin Coll.

The female (B.M. Type No. Rh. 204) from the same source is very dark above with only a trace of blue distally in the cell on the hind wing, and a large blue patch on the fore wing occupying the bulk of areas 1a, 1b and the cell, but only extending into area 2 in the form of a few scattered scales. The underside is smooth dull ochreous, the markings very fine and delicate.

Apparently confined to Mindanao.

(To be continued.)

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

By W. G. SHELDON, F.Z.S., F.E.S.

PROBABLY as little is known of the lepidoptera of Sutherlandshire as of any county in Great Britain, and the Assynt district being situated in the extreme west, its nearest point some thirty miles from the railway, it almost necessarily follows that it is one of the least known of that extensive county.

The literature on the subject is very scanty. Unquestionably the most important notes I can find are contained in an excellent paper by Mr. F. C. Hanbury in the 'E. M. M.,' vol. xxxi, p. 1, but as Mr. Hanbury's time during his stay was largely taken up by botanical research, and the weather at the time of his visit being extremely unfavourable, with almost continuous rainfall, but few species of Lepidoptera were noted. There is also a short list of thirty-eight species by Dr. W. W. O. Beveridge in the 'Annals of Scottish Natural History,' vol. i, p. 172 (1892). These two papers are all the records I can trace, but I understand from Mr. R. Adkin that William Salvage spent the summer of 1894 in Assynt; there is, however, no record of the species he took further than reports by Mr. Adkin of specimens received from him in the 'Proceedings of the South London Entomological and Natural History Society' for the years 1894-5.

I fancy the late Dr. Buchanan White knew the district fairly well—more perhaps as a botanist than as an entomologist; but he does not appear to have published anything on either subject.

I had Assynt in my mind for many years, but it was not until 1920 that I was able to traverse the ground which had been so often thought of.

Perhaps before dealing with the Lepidoptera met with I had better describe the district, which is in certain respects quite one of the most remarkable in Britain.

If one examines the map of Scotland it is seen that the only railway in the county of Sutherland runs up the east coast, which for a few miles inland is comparatively well cultivated and wooded; but between this and the west coast, on which Assynt is situated, there is a stretch some thirty miles wide of bleak sterile mountains and moors, almost treeless, and except for an occasional shepherd's hut, and at wide intervals two or three inns, frequented almost entirely by trout and salmon fishermen, there is not a sign of human habitation.

It follows that the insect fauna of the west is extremely isolated from that of the rest of Britain. Probably this state

of isolation has existed for several hundreds of years at least, but not for more, at any rate to such an extent as at present.

The Highlands of Scotland are to-day very largely treeless; they were not always so. At the dawn of history we read of the Great Caledonian Forest, composed principally of Scotch fir (*Pinus sylvestris*) and silver birch (*Betula alba*), covering vast tracts of country now bare of trees. Isolated bits of this forest still remain, for instance, along the southern shore of Loch Rannoch, and in Glen Orchy. Apparently the principal cause of this depletion of timber was fire.

In almost any part of the Highlands, even up to 2000 ft. above the sea-level, if one looks at a section of the peat where it has been worn through by the action of water, one sees roots and trunks of trees, mostly those of Scotch fir, and almost invariably they bear the marks of fire. How these fires originated I am not certain; no doubt some were caused by drought and subsequent accidental firing; others were probably the result of clan feuds.

After passing this bleak stretch of moor and mountain one comes to a district singularly beautiful, even grand, and extremely interesting to the Nature-lover. The mountains around Loch Assynt, one of the most beautiful sheets of water in Britain, are very remarkable, and although none of them quite reach 3000 ft. in height, Suilven, Canisp, and Quinag amongst others, are three of quite the most isolated and picturesque heights we possess; the view especially of Suilven from the neighbourhood of Altnacealgah on the way to Assynt being very remarkable, the mountain standing up above its surroundings like a huge tooth, and from this point appearing to be quite inaccessible.

The whole district is studded with hundreds of small lochs, and in the hollows and on the sheltered sides of the mountains there is a fairly luxuriant growth of trees.

Assynt is unfortunately not a cheap district to visit at the present time; the cost of a first-class ticket comes to rather more than in 1912 I paid by the same class to travel beyond the North Cape in Arctic Norway! and even a third-class ticket costs a good round sum. The hotels, which are in most places the only possible places of accommodation, are the reverse of inexpensive; moreover, as they are usually full of fishermen, who are almost solely catered for, they are, perhaps, not in certain respects ideal places of sojourn for an entomologist.

In search of information as to where I should put up, I read in a local fauna book a statement that the north and eastern sides of Loch Assynt were of limestone formation and possessed a very beautiful flora, and as there was at the extreme north-eastern end of the loch, at a small hamlet named Inchnadamph, a famous fishing hotel, which had the reputation of being extremely

comfortable, I made arrangements to pass several of the weeks of 1920 there. I should mention that Inchnadamph was a place of sojourn of my predecessor, Mr. Hanbury.

Unfortunately the beautiful flora hardly materialised. It is true there were a few very local plants, including *Saxifraga azoides* and *Dryas octopetala*, which made a brave show, but the whole district was too bleak and destitute of wood and too wind-swept to harbour a numerous insect fauna, and although I did turn up a few interesting species, and passed a most pleasant time at the very comfortable hotel, the result of my visit, extending from June 20th to July 16th, was hardly satisfactory from the point of view of species or specimens procured. Fortunately, after my stay at Inchnadamph I spent a few days at the village of Lochinver, on the west coast, and what I saw there induced me to return this year. After securing apartments in a private house, and accompanied by my friend, the late Mr. F. G. Whittle, I reached Lochinver on June 18th last and stayed there until July 26th; Mr. Whittle remained until September 6th. The results of his observations during the period of my stay, also those which he made after my departure, and a list of the species of Tineina met with by him at Lochinver, are also included in this paper.

To reach Assynt one takes the train to Invershin in East Sutherland; from this station there are, daily, comfortable cars traversing the forty-five miles to Lochinver in about four hours, at a cost of sixteen shillings. The ride, perhaps unique in Britain for its wild, desolate grandeur, reaches its climax at the lower end of Loch Assynt. On the right of the road the precipitous cliffs of Quinag tower up, whilst the road runs along the shores of the beautiful lake on the left. At the head of the loch the shores are bleak and sterile, but gradually they begin to be clothed with fine old birch and rowan trees, and clumps of naturally planted Scotch fir. I do not know a more beautiful Scotch scene than the lower end of this charming lake.

The outgo of the loch is by the rapid and beautiful river Inver, some eight miles long, which empties into the head of a fjord or sea loch penetrating inside the general coast line about three miles. At the edge of this fjord the village of Lochinver is situated.

On the south side of the inlet stands what was formerly a seaside house of the Dukes of Sutherland, but is now known as the Culag Hotel, exceedingly comfortable and well appointed, but distinctly expensive.

Around this house the hillsides have been planted extensively with many kinds of trees, now of good size, and including larch, spruce, Scotch fir, ash, beech, birch and rowan. On the north side of the inlet there is a certain amount of natural wood, mostly birch, willow and aspen, and a number of small flowery crofters' meadows.

The picturesque banks of the Inver, which are very precipitous and winding, are extremely sheltered from all winds, and as for the first two miles or so they have been planted with similar trees to those around the Culag Hotel, and in addition there is a fairly luxuriant natural growth of sallow, birch and sweet gale, they form a very suitable sugaring ground.

The whole district around Loch Inver is extremely rocky and irregular, with numerous small lochs in the hollows, and where there is shelter from the prevailing west winds there is a luxuriant growth of sallow of several species. *Myrica gale* abounds all over the district, as do the two common *Ericas* and *Calluna vulgaris*.

One of the drawbacks is that there is very little *vaccinium*, and what there is consists entirely of the most universally distributed species, *V. myrtillus*. The nearly allied *Arctostaphylos uva ursi* is locally a common plant.

Lochinver gets the full effect of the Gulf Stream, and for the latitude the climate is extremely mild; snow very seldom lies in winter, and the absence of severe frost is proved by the presence of the common tree fuchsia, which will stand all there is unprotected in the gardens. The rainfall in Assynt is very heavy. I gather that it almost always rains in the winter; certainly even this year there was rain more or less on the majority of the days during my stay, and I learned from Mr. Whittle that there was much more rain after my departure.

The mildness of the climate has produced its effect on the Lepidoptera; there is very little melanism, and in some instances the type occurring is distinctly southern. The most remarkable is unquestionably *Epinephile jurtina*, some of the specimens differing very little from those I have from the South of France, and from Spain—that is to say, they come very near to var. *hispulla*, Hüb.

We know that this form occurs in the Scilly Islands, but it will come as a surprise to lepidopterists to be told that it is also found in the North of Scotland. On the other hand the form of *Pieris napi* from the bleak and treeless Inchnadamph, fourteen miles inland, and amongst the mountains, if not actually the Alpine and Arctic form, var. *bryoniae*, Och., comes nearer to it than any British race I have seen.

One of the most abundant species to be found at Lochinver, and the principal reason of my second visit, was *Peronea hastiana*. On the afternoon of the day before I left Lochinver in 1920 I discovered that the sallows everywhere contained enormous numbers of the larvæ of this species, and the forms bred being so fine and variable I was very keen to get a further and larger supply of larvæ.

Just outside the coastline, blocking up the entrance to the fjord, and some three miles from its head, is the little island of Soyea, entirely treeless, and perhaps one thousand yards long

by five hundred yards wide. This island is uninhabited except for a few sheep and goats, and quantities of sea-fowl. I paid several visits and the results were most interesting. The island has, considering its size and situation, an extensive Lepidopterous fauna. The larvæ of *Peronea hastiana* swarmed, as on the mainland, and several species occurred which could not be found elsewhere, including *Anthrocera filipendulae*, *Sericoris cespitana* and *S. littoralis*. Perhaps the most remarkable colony on Soyea was one of *Abraxas grossulariata*, which was rare on the mainland but swarmed on the island. The usual food-plants did not exist, and the only plants in its haunt, except a very limited amount of grass, were bracken and *Calluna vulgaris*; I have not any doubt but that the larvæ fed upon the latter, which, according to Mr. South in 'British Moths,' is the food-plant in the Hebrides.

I cannot say that Lepidoptera were met with at Lochinver in great abundance, except in the case of a very few species; in fact the great bulk of them were distinctly rare. Nor can I say that any great rarities were found; one could hardly expect these in such a remote corner of the British Isles. Still, a large number of species occurred, some interesting ones amongst them, and the forms in many cases were distinctly interesting. The number of species observed in Assynt in 1920 and 1921 was 232, as follows:

Those species marked with an asterisk occurred at both localities. It should be noted that sugar was only tried at Lochinver.

Pieris brassicae. *—Common at Lochinver, one or two specimens in the hotel garden at Inchnadamph; large, with the black markings well developed.

P. rapae.—Lochinver.

P. napi. *—Towards the end of June, 1920, I observed several whites flying in a swamp near the head of Loch Assynt; these were found to be worn examples of this species very strongly marked, and with a good deal of dusky clouding on the bases of the superiors, thus showing some approach to the boreal and alpine form ab. *bryoniae*, Och. A search of the sides of a ditch draining the swamp resulted in my finding a number of ova and larvæ feeding upon *Cardamine pratensis*, the only wild crucifer I saw in the district. The resultant imagines, 24 in number, emerged in May last, and are very interesting. Although not identical with ab. *bryoniae*, they present a very distinct approach to that form, and several of the females are very near examples I obtained at Semmering in Styria at a height of about 4000 ft. in 1910. The bases of the superiors are dusky, and the veins are very strongly developed owing to their being thickly shaded with dusky scales; the undersides are very strongly veined, the ground-colour of the inferiors

being greenish-yellow with very strongly-developed fuscous shadings on the veins. The females on the upperside strongly resemble the example figured in Barrett, plate iii, fig. 1c. Two of them have an ochreous ground-colour, in this respect also resembling *ab. bryoniae*. There is no doubt but that at Inchnadamph the species is single-brooded. At Lochinver on July 17th last I netted a single very fresh example, the only one noticed, a female. This specimen resembles very closely the second-brood south of England form; it has only slightly dusky shaded bases to the superiors, the usual dark markings are well developed and bright, and the veins on the underside are similar to the southern summer form. There is not any doubt in my mind but that this is an example of a second brood; it closely resembles Barrett's figure on plate iii, fig. 1a.

(To be continued.)

NOTES AND OBSERVATIONS.

COLIAS EDUSA MIGRATION IN CANNES DISTRICT.—We have had a remarkable visitation of *C. edusa* to the waste just around our villa, and in to the town (Le Cannet). Almost wherever *Inula* and calamint were blooming it swarmed, and passed downwards towards the coast from September 10th to October 20th, when with the cessation of the flowering of *Inula viscosa* they ceased too, having, I feel certain, re-migrated to Algiers or Egypt *via* Corsica (?). At any rate I am sure they re-migrated, their destination being, of course, a hazard. That these insects had migrated in the first place to Le Cannet I insist upon from the following facts. Firstly, they had all undoubtedly travelled, and showed signs of wear. Secondly, the insects themselves were larger than the normal local late summer brood (? first autumnal), and appeared to agree with the large form described as being found in Sicily (*cp.* Dr. Verity's remarks, 'Entom.,' vol. liv, p. 187). Thirdly, they were almost all females, or at least 80 per cent.—*abs. helice* and *pallida* about 30 to 40 per cent., *Helicina*, a few, a beautiful bright (fore wings) cadmium female, with green-yellow hind wings being to me a new form, border as in *ab. adoratrix*, Stauder: others of varying depths. One *pallida* with damaged right fore wing is the largest *edusa* I have ever seen. I took about 80 *helice*, *helicina*, *pallida*, and about 60 other orange forms, typical, etc. This series convinces me that it is impossible to say where one form leaves off and another begins: that is to say, all the aberrations and varieties merge one into the other in the case of *helice*, *helicina* and *pallida*, for they show all shades. During the latter part of the passing, for such it was, as the whole ground was worked every day by Mr. Tucker and me, and a new batch identified and picked out which, for the greater part, were not there the previous day, and together with the fact that as we worked inland they became scarcer, although the plant did not, seems to indicate that they worked down to the coast, and, as I think, crossed the sea. The almost entire disappearance with the passing of the flower was also most striking, although at the time of

writing (November 13th) there are still stragglers. Both type and *helice* visited the Zinnias in the gardens until the welcome break in the unprecedented drought a few days ago. Males became more plentiful the last fifteen days of the flight, and some of these, as well as females, were smaller and of the pale-yellow costa type known as *chrysothemiformis*. Verity, transitional to *gen. vern.* By the way, it is curious that Dr. Verity has given this name, for although I knew nothing of the name having been accepted I had noticed this resemblance, and have the name in my correspondence with Mr. Rowland-Brown, which only goes to show how striking is the resemblance to *C. chrysotheme*. The late autumnal partial reversion to spring forms occurs here in many Pieridae, *P. rapae* and *P. mannii* especially, *P. brassicae* and *Pontia daplidice*; all these often show this peculiarity.

C. E. MORRIS: Le Cannet, Alpes-Maritimes, November 13th, 1921.

A century ago Stephens figured *C. chrysotheme* as a British species with rather vague indications of origin (Stephens, 'Haust.', i, fol. 2). Feeling some doubt on the subject, and that Stephens might have figured *C. edusa*, *gen. vern.*, in error, I asked my friend Mr. Sheldon to examine the record for me, being confined to the house, and not possessing Stephens' work. He agrees that the insects, ♂ and ♀, figured are *chrysotheme*, but, as I myself, is convinced that the models were of foreign origin. I may add that collectors in France again and again have announced the capture of *chrysotheme*, though none of the great cabinets contain an authentic example. Those announced have usually turned out to be the very *chrysothemiformis* of Mr. Morris's note.—H. R.-B.]

BLUE SPOTS IN CHRYSOPHANUS PHILEAS.—With regard to the discussion as to damp places and climates, causing or affecting the blue spots in *C. phileas*, I may add that we have had a drought unprecedented in memory here, and the hottest of autumns, and the blue spots are larger and bluer than I have ever seen them. But I think damp was found to have nothing to do with it, and you had "indigenous" evidence that the spots were developed just as finely in dry places as upon marshes.—C. E. MORRIS: Le Cannet, Alpes-Maritimes, November 13th, 1921.

COLIAS ELECTRA AND C. LESBIA (?): PREPONDERANCE OF PALE FORM.—I have read with interest Mr. Rowland-Brown's article on the variation of *Colias edusa* ('Entom.', vol. lvi). I thought that perhaps it might be useful to state that when I was in Natal in 1897-8 I took *C. electra* there commonly, but that the proportion of females of the pale form greatly outnumbered the ordinary yellow females. Trimen, in his work on South African butterflies, announces the pale female form of *electra* scarcer than the yellow form. Among those of *electra* I took, I find that the proportion of the pale females was about 3 to 1 of the yellow form. My specimens were all taken in the Ladysmith district. My wife collected any butterflies she could for me in Uruguay, and among the things she brought back were several, I think, of *C. lesbia*. They consisted of about 6 males, two dark, and 10 pale females. They were all taken casually, so it seems to indicate that the pale form predominated. Perhaps in the warmer climates the pale females outnumber the yellow form.

and as the genus approaches colder regions the reverse takes place.—DUDLEY WESTROPP; National Museum, Kildare Street, Dublin.

COLIAS EDUSA IN SOUTH DEVON.—Further to the Rev. J. E. Tarbat's record of the appearance of *C. edusa* at Budleigh Salterton in August last ('Entom.', vol. liv, p. 242), the insect seems to have been fairly common along the coast, as I saw it in some numbers in September. My son noticed the first, apparently a female, flying over the shingle at the base of the cliffs on September 15th just below Salcombe Regis. On going up the valley to a flowery meadow we saw several others and captured two, one of which was a female. One or two rough days followed, but on visiting the same ground quite a number were seen, a good many of which were flying over a field of marigolds apparently seeking places of rest for the night. One or two more were taken but they were somewhat worn and were released. In the course of a week the brood dispersed, and odd ones were noted a few miles inland and on the coast near Ladrum Bay. The female taken on the 15th was put in an ordinary glass jam-jar with some red clover and covered with net, which was placed in a sunny window with partial shade. She laid about one dozen eggs on each of the first three days, and on the fourth, which was exceedingly hot, nearly 100, but a good number of the latter proved unfertile. The obliging female then died. The eggs began to hatch on September 27th and continued to do so irregularly for about three weeks. On reaching home in October the larvæ were placed on potted-up plants of *Trifolium repens*, upon which they seemed to do well. Red trifolium they refused when white was available. As there was a small patch of lucerne within fifty yards of the house, a crop which I have never seen grown in this neighbourhood before, a number were given this food as a change of diet and commenced feeding upon it at once. Being so late in the season and as I have no glass the cages were placed in a warm bathroom at night and later inside a heated linen cupboard. The temperature of the cupboard went up to a great height occasionally, especially once when the door was inadvertently shut, but the larvæ seemed to get active with both heat and sunshine and generally began to feed. The young larvæ ate their own eggshells, and at each instar devoured every fragment of the old skin, beginning with the head. Not a single old head or skin was found in the cages during the larval stage. The first pupated on October 20th. The linen cupboard was still requisitioned, and the first imago appeared on November 3rd and the last on November 22nd. In all 56 were bred, 31 males and 25 females, of which 10 were var. *helice*. Out of this total there were five cripples. Most of the specimens are of good size, some being larger than those taken at Sidmouth. The female from which the eggs were obtained was normal in coloration with the light spots on the margin of the fore wing well marked. The majority of the females reared and especially the *helice* are remarkable for the absence of the marginal spots, many of them being very dark and the black bands quite deep. I am told that for 40 per cent. of the females to be *helice* is unusual. Can this be accounted for by the absence of sunshine or the heat of the linen cupboard? The males are typical.—G. HANSON SALE; Coxbench, Derby.

FOOD-PLANTS OF *CALLOPHRYS AVIS*, AND *CELASTRINA ARGIOLOUS*.—Any doubt as to *Arbutus (unedo?)* being a food-plant of *C. avis* is set at rest in the first part of fasc. xix. "Études de Lépidoptérologie Comparée" (January, 1922) which has just reached me from Rennes. This volume is devoted wholly to the Lepidoptera of Morocco, and in the note on *C. avis*, Chpmn., it is stated that Mr. Harold Powell found it rather common in the Zehroun district of the Lower Atlas in March and April last year. The larva feeds there on *Arbutus*, on which shrub a female was observed laying her eggs. In November, 1920, Mr. Harold Powell discovered larvæ of *Celastrina argiolus* also feeding inside the flowers of the *Arbutus*, and observed a female ovipositing on the young shoots of hawthorn in February, 1921, at Mrassine. I mention this because neither *Arbutus* nor hawthorn is included in Tutt's exhaustive list of food-plants for *Argiolus* ('Brit. Butterflies,' vol. ii, pp. 440 and 447-448). In a shrubbery in my garden, *Ilex (loc. cit.)*, holly and *Arbutus* grow side by side, and ivy is not far off, but I never saw the females egg-laying on *Ilex*, or *Arbutus* which flowers here in October and is a great attraction to *P. atalanta*, though I did once detect a female laying on *Berberis* (Gallipoli, *loc. cit.*). I regret to add, however, that *argiolus*, which had been fairly abundant here for many years, disappeared entirely in 1920. Whether *Arbutus* is the food-plant of *C. avis* on the French Riviera in those localities where *Cornaria myrtifolia* is absent remains still, I believe, to be proved by experience. (Cp. Dr. Chapman's, and my own notes on the subject, 'Entomologist,' vol. xlix (1916), pp. 187-188.)—H. ROWLAND-BROWN; Harrow Weald, January 18th, 1922.

EROMENE OCELLA, ETC., IN LANCASHIRE.—On October 5th, at 11.45 p.m., I observed two moths at the window of my room. On examining same I find one is *Eromene ocella* and the other *Achroa grisella*. I have been successful during past season in taking a nice series of the new British species, *Blastobasis lignea* and var. *adusta*, along with intermediate forms. I have taken a few each year since 1918, but it was only identified last winter by Mr. Durrant. —ALBERT E. WRIGHT; "Brunleigh," Kents Bank Road, Grange-over-Sands.

PYRAMEIS ATALANTA IN DECEMBER.—Perhaps it might be of interest to record that I saw a specimen of *Pyramis atalanta* on December 11th, 1921. This seems rather late in the season for the species.—J. M. JACQUES; The Red House, Banstead, Surrey.

THE PUPAL HABIT OF *TELEA POLYPHEMUS*.—My late friend and correspondent, Mr. E. N. Collins, who resided for several years in Canada, removed about 1886 to the neighbourhood of Jacksonville, Florida, and very soon after wrote me as follows: "Can you give me any idea why *polyphemus* here fastens its cocoon to the branch of the tree instead of rolling it up in the leaf and letting it fall to the ground, as it always does in the Northern States?" With the inquiry he enclosed a small cocoon, showing the invariable attachment to a twig of Florida cocoons, which is a strong silken pedicel about 5 in. in length. I replied suggesting that in the Northern States the cocoons would lie warmer on the ground amongst dead leaves during

the severe winters, whilst field-mice and other possible enemies would be hibernating, but that in the usually mild winters of Florida they would be far safer if hanging upon the trees, as the mice might not be dormant. I have searched in vain amongst American entomological literature for any reference to this habit of southern pupæ of *polyphemus*, but have recently accidentally found a paper in the 'Canadian Entomologist,' vol. xxvii, September, 1895, by the late A. R. Grote, entitled, "Notes on the North American Saturnina." After giving particulars as to the larvæ, Grote continues: "There remains for me to point out some facts with regard to the formation of the cocoon in our American genera which induces my arrangement of the family. In *Attacus*, *Philosamia* and *Callosamia* the larva attaches the deciduous leaf, which forms the basis and natural attachment for its web, firmly to the branchlet by a pedicel of silk. Evidently this is an acquired habit. It has been found more useful to the species that the cocoon be prevented from falling to the ground with the fall of the leaf. *Telea* and *Actias* have not this habit. The cocoon falls in the autumn with the leaf which was used in the spinning. . . . I therefore place the genera with the pedicel habit at the commencement of the family, *Saturnia* and *Samia* following, and closing with *Actias* and *Telea*, in which the thinner cocoon falls with the leaf to the ground." It is evident from the above that the departure of the southern cocoons of *polyphemus* from the habit of the northern examples was quite unknown to Grote, or it would have materially affected his classification of the group. If, as I imagine, this point is still very little known, it seems advisable to place it on record; it certainly is a very remarkable adaptation of a species to the varied circumstances of its environment.—Geo. C. GRIFFITHS, F.E.S.; 3, Leigh Road, Clifton.

VITALITY OF BRENTHIS EUPHROSINE.—In June, 1919, I went with Mr. A. Simmons to Lincolnshire for a few days' collecting. On the last morning five *B. euphrosyne* were captured and boxed. On reaching our rooms they were put in a killing bottle. Lunch was hurried as we had to catch a train. A question arose as to whether they were dead. We decided that they must be, as a sufficient time had elapsed. They were accordingly taken out of the killing bottle and put in a Newman's relaxing tin. It was ten days later before time was found for setting, but when the tin was opened and the cotton-wool lifted, all five of the *Euphrosyne* crawled out and at once began to fan in the lamp-light. They had been tightly pressed between the wool and were quite uninjured. They are now in the cabinet. The tin was rather an old one.—G. HANSON SALE; Coxbench, Derby.

SYMPETRUM SCOTICUM, DON., IN DORSET.—Mr. Lucas says, in his "Notes on British Odonata in 1920," that Mr. Stowell's record of *Sympetrum scoticum*, Don., on Parley Heath "seems to be almost or quite the only record of its occurrence in Dorset." The species is abundant in all suitable localities, in late summer and autumn, throughout the county. It has been recorded by C. W. Dale in the appendix to his 'Lepidoptera of Dorset' (first edition, 1886) as "generally distributed." I alluded to it as "abundant as usual" in

my notes on "Dorset Odonata in 1911" in the 'Entomologist' of July, 1912. It is also called "abundant" in the 'Proceedings of the Dorset Field Club,' 1917, p. 226. —F. H. HAINES; Brookside, Winfrith, Dorset, January 1st, 1922.

SOME NOTES ON THE HABITS OF ♂ TABANIDÆ.—The following observations were made in the New Forest—an especially favourable habitat, as most visitors there will admit from painful experience, for the blood-sucking "horse flies"—but the majority of the species enumerated occur commonly elsewhere in the south, so that it is not thought necessary to "localise" the subject of this article. The scarcity of the harmless ♂ Tabanid compared with the abundance of the ♀, with its apparently insatiable thirst for fresh blood, seems to have puzzled our too few Dipterists, and one seeks in vain through the text-books for some satisfactory explanation of the cause. Most authorities, however, seem agreed, and with reason, on one point—*i. e.* the liking of the males for heights. Whether hovering "over mountain tops" (*sic*) or merely sunning themselves on the leaves of the highest oaks, it is difficult to tell, but undoubtedly they spend the most of their time in the higher air, whence, it seems reasonable to suppose, the female joins them after sanguinary work below. [At least such seems to be the case with the bigger species (*Tabanus*), but the smaller (*Chrysops*) prove a partial exception, the males of this family, although adapted, as their wings and build indicate, for rapid flight, show a fondness for flowers, and follow their respective females in possessing a much more sluggish habit than their larger brethren.] Previous to the past tropical summer (1921), the capture of a ♂ *Tabanid* was considered by me quite *the* catch of a day's hunting, but the exceptional conditions produced by prolonged drought somewhat altered this opinion, and besides resulting in the capture of a large number of specimens, gained me a useful insight as to the habits of these remarkable creatures. Towards the middle of July most of the Forest streams were reduced—in the expressive phrase of an entomological friend—to a chain of puddles, and it was whilst prowling round a "muddy" link of the erstwhile clear and trickling "water (?) " that a growing suspicion that many of the thirsty forms of insect life continually "dipping" into the pool would prove to be ♂ *Tabanidæ* at last became a certainty by the capture of a number of *T. bromius*. The catching was a matter of some difficulty, the flies coming down with almost the swiftness of a falling stone, just "sipping" the water and then flying straight up again, the art being to net them on the uptake without collecting more of the pool in the bag of the net than could reasonably be helped. By perseverance, however, and the use of a spare "kite" net—the usual small implement used by Dipterists here being useless—I managed to obtain the following species of ♂ *Tabanidæ* by the end of the day (identification, of course, is difficult, but no doubtful specimens are included): *Hæmatopota pluvialis*, Linn.; *Theropieetes solstitialis*, Meig.; *Th. tropicus*, Harr.; *Tabanus bovinus*, Linn.; *T. bromius*, Linn.; *T. maculicornis*, Meig.; *Chrysops cecutiens*, Linn.; *C. relicta*, Meig., and *C. quadrata*, Meig. The capture of three

* I must confess to almost complete ignorance of Continental works on Diptera.

species of *Chrysops* from the same pool was rather extraordinary, as up to then I had not found even ♀ ♀ of *relicta* in the Forest at all. For the sake of my determination I was greatly relieved to take several females later from the same locality (Rhinefield). The *Tabanus bovinus* males taken numbered six, and were the first I had captured of the sex. The flight is extremely swift and difficult to follow, but they seemed to come down from a great height, give one "dip" or a series of "dips"—in which latter case invariably in a rapid circle—and then instantly fly up again out of sight. The smaller species of *Tabanus* behaved in much the same manner, allowing for their size and weaker flight, but *Therioplectes solstitialis* (next to *T. bromius* the commonest present) was much more casual in its mode of flight, and not infrequently "rested" for a short space on some convenient leaf overhanging the stream. The "rest" was presumably for the purpose of imbibing the water collected on the forelegs during the "dip" above mentioned, for, so far as I could make out from my necessarily brief observations, this was the method used for drinking, although possibly a certain amount of moisture is gathered in the beak-like proboscis as well.* Moreover, in support of the above theory, the rest was never a preliminary to a dip, although I have found the same species (♂) sitting on leaves of bushes† in the drives of enclosures miles from any surface water, in which case the insect was probably merely carrying out a habit common to all Diptera—i. e. a love of basking motionless in the sun. On several occasions in the spring I found *Therioplectes tropicus* ♂ ♂ sitting on damp mud by the margins of partially dried-up puddles, but most specimens of *Tabanus* upon being captured in this position have simply proved to be females. *Chrysops* and *Hamatopota* males, however, are great "mud-sitters," and the former have also a liking for flowers (especially *Senecio* and *Mentha arvensis*), which causes them to be much more commonly taken than the larger members of the group. *Atylotus fulvus*, Meig., was one of the species that failed to turn up at my observation pool, preferring more open, heathy woods, or those adjoining heaths, but I managed to secure a male last year (1920) on Setley Plain, near Lymington. In this case the creature must have been flying just over my head at the time, for upon hearing a distant "buzzing" I whirled my net rapidly, and so luckily caught undoubtedly the most handsome of all our ♂ *Tabanidæ*. With a remembrance of the above capture I tried the same locality in 1921, but this time without result. The formerly heathy and boggy ground was dried brown and cracked by the sun, and even the females were at a premium. Another absentee was *Tabanus autumnalis*, Linn., a fine large species which is none too common in the Forest—I write from the Dipterist's point of view!—but I could have taken the males of several common species (notably *T. bromius*) in scores had I desired, to say nothing of hundreds of females, and yet not once did I witness a pairing. Judging from the habits of both the ♂ and ♀ *bovinus*, this all-important function must either take place in the air, or, as the only

* Such as when a "series of dips" is given. See *bovinus*.

† Generally in the early morning. In normal seasons the dew on the leaves may provide them with sufficient moisture, as one seldom sees the males at water, or mud, except in very hot and dry weather.

alternative, high up on some sunny tree-top. Certainly it is the habit of the ♀ to fly high, as one seldom hears the extraordinary deep and characteristic hum until the insect is actually circling round one—a good enough indication that the creature first views its victim from a considerable height. Again, the only ♂ *A. fulvus* taken was undoubtedly hovering over my head at the time, and may have been making a final unsuccessful bid for some elusive “she” just alighted on my coat from on high. “From on high,” however, may be a mistaken term in the case of the heath-haunting *fulvus*. The wood-frequenting species, with their intolerance of deep shade, would naturally keep above the tree-tops, except when a forest clearing, such as afforded by the comparatively modern “drive,” allows the females to descend on some passing prey: but the *Tabanid* of the open heath is under no such restriction. He may fly where he likes, and for all we know may take his partner for life on some neighbouring gorse bush. If so, there some day I shall find him! —HUGH JONES: 7, Gosport Street, Lymington, Hants.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, October 17th, 1921, Mr. R. Tait, President, in the Chair.—Exhibitions were numerous and varied as is usual at the opening meeting of the session.—The Hon. Sec. exhibited on behalf of Mr. O. J. Wilkinson photographs of (a) *P. cardui* pupating, (b) larva of *Hadena pisti*, (c) an unusual variety of *P. phloxis* taken at Delamere having the right side var. *schmidti* and the left side typical.—Mr. W. Mansbridge showed Lepidoptera from North Lancashire, *Vanessa io* with nearly blind eye-spots on hind wings from Cark; *Lycæna ægon*, var. *masseyi*, from Witherslack, and a short series from Delamere for comparison.—From Arnside, Westmorland, *Argynnis euphrosyne* with pale ground-colour, *Thecla betulae*, *Nicomades tages*, *Asphalia diluta*, *Phytometra viridaria* and *Ennychia octomaculalis*; from Formby, near Liverpool, a series of *Ebulea croceatis*, and from Cark a short series of *Cinophos obscuraria* of a dark grey colour.—The Rev. F. M. B. Carr showed a long series of *Eupanda tululenta* from his garden at Alvanley, and said it had been abundant there in the autumn; also two fine varieties of *Asphalia flavicornis* and several *P. cardui* from Delamere.—Mr. S. P. Doudney northern insects as follows: *Lycæna minima*, *Hyria muricata* and *Strenia clathrata* from Witherslack; *Erebia epiphron*, *Coremia munitata*, *Larentia cæsiata* and *Venusia cambricaria* from Cumberland. In the same exhibit was a fine under-side aberration of *Lycæna ægon* with elongated spots captured at Delamere.—Mr. S. Gordon Smith was unable to be present, but sent a fine drawer of *Smerinthus tilie* and a large number of varieties of other species captured or bred this season in various localities; prominent among the latter was a specimen of *Triphæna pronuba* with hind wings

nearly white, bred from a wild pupa dug at Tarvin near Chester; an ab. of *Vanessa urticae* with nearly black hind wings captured at Parc Llwydiarth, North Wales; *Triphaena fimbria* with crescent mark on hind wings, bred from Delamere, two vars. of *Nemeophila russula* also with hind wings black nearly all over taken in the New Forest, confluent forms of *Zygena trifolii*, *Boarmia roboraria*, *Phorodesma pustulata*, *Pterostoma palpina* and *Leucania turca* from the New Forest. A fine series of *Cidaria truncata* from various localities, comprising vars. *centumnotata*, *commantata*, *perfuscata*, etc., was much admired, and a long series of *Boarmia repandata* which contained several examples of the Penmaenmawr melanic form characterised by whitish submarginal blotches on the black ground.—Mr. Chas. P. Rimmer had a box of Micro-lepidoptera taken this year chiefly round Liverpool, also his fine series of *Hibernia defoliaria* from Delamere.—Mr. A. W. Hughes exhibited from Witherslack a long series of *Carsia paludata*, *Lycæna ceyon* and *Cænonympha typhon* and *Argynnis euphrosyne*, the last being from Cartmel.—Mr. R. Tait brought Wicken insects as follows: *Catocala nupta*, *Apamea leucostigma* and var. *fibrosa*, *Calamia phragmitidis*, *Noctua umbrosa*, *Hadena trifolii* and *Phibalapteryx vittata*, and a few *Papilio machaon* bred from ova found in 1920. *Plusia moneta* is now well established in Cheshire, as shown by a long series from Carrington included in this exhibit. The New Forest was represented by *Macroglossa fuciformis* and *Nemeobius lucina*, and North Wales by a nice series of *Agrotis ashworthii*.—Mr. J. B. Garner-Richards, Mr. J. W. Griffin and Mr. H. B. Prince also made interesting exhibits.—WM. MANSBRIDGE, *Hon. Sec.*

RECENT LITERATURE.

Insect Transformation. By G. H. CARPENTER, D.Sc. 8vo. Pp. x + 282, 4 Plates and 124 Text-figures. London: Methuen & Co., Ltd., 1921. Price 12s. 6d. net.

A carefully prepared volume and well worth the money, which unfortunately cannot be said of all the recent attempts of writers of this style of entomological publication.

The author takes as his first example a grasshopper, which is dealt with very fully as to morphology and development, and follows this up with similar but briefer studies of a dragonfly and of a moth. This is succeeded by chapters on development in the Exopterygota, the Endopterygota and some Apterygota, in which a very large range of types is surveyed and the salient features of their transformations emphasised. There follows a short chapter on classification, and then the most important question of the influence of environment on all stages of insect life is dealt with ably and at considerable length. To many readers the last chapter, on the phylogenetic interpretation of the known facts of development in the order, will probably prove the most interesting.

The Lancashire and Cheshire Naturalist, vol. xiv, No. 1, 1921.

The above part of this well-known journal contains a short but interesting article by J. C. Melvill on the Sidebotham Collection of British Lepidoptera recently presented to the Manchester Museum. The collection is a valuable one, being chiefly remarkable for the number of rarities it contains, such as, to mention only two species, a very fine series of *Heodes dispar* and a genuine British specimen of *Bryophila alba*.

OBITUARY.

DR. T. A. CHAPMAN.

THE angel of death has taken a heavy toll from the ranks of British Entomologists during the past year, but the beating of his wings has not been heard so loudly as when it heralded the departure from amongst us of Thomas Algernon Chapman; for in him Entomology has lost one of its foremost figures, one who was respected and admired by all who knew him.

"The Doctor," to give him the name by which he was universally known by his very numerous friends, was born at Glasgow on June 2nd, 1842, and he would thus be in his eightieth year at the time of his death, which occurred at his residence at Reigate on December 17th last. He was the son of Thomas Chapman, himself a well-known entomologist, from whom no doubt he inherited his tastes for the insect world. Although born at Glasgow, Dr. Chapman was English on both his father's and mother's side.

According to the "Times" he "qualified as L.R.C.S. Edin. and M.D. Glasg. (Honours). He became Resident Physician and Surgeon of the Glasgow Royal Infirmary, and afterwards joined the Staff of the Abergavenny Asylum; later he obtained the appointment of Medical Superintendent of the County and City Asylum at Hereford," an appointment he relinquished about the year 1896. Shortly after this date he came to reside at Reigate; he was never married.

Without doubt the late Dr. Chapman was one of the greatest and most scientific entomologists we have ever produced, and one who in certain departments must be regarded as the greatest exponent Britain has given the science. Some of his characteristics can perhaps be best conveyed by quoting the following description written of him by his great friend and co-worker the late J. W. Tutt some twenty years ago: "An unlimited capacity for hard work, a scientific training that can only be attained by entomologists who follow medicine as a profession, an omnivorous reader, a logical reasoner, and a profound thinker, these are amongst the factors that have united in placing him in the very front ranks of the entomologists of his time." Foremost amongst his remarkable powers was his acuteness of observation; little facts that others would not have noticed were seized upon, their significance realised, and important deductions made therefrom. His clear logical mind and soundness

of judgment were of the greatest importance, and usually led him straight to the desired goal.

It was the writer's good fortune to spend a few weeks at Hyères during one of "The Doctor's" visits to that resort; and he vividly recollects the walks and talks we had, and his wonderful powers of observation. Nothing seemed to escape his notice, and upon everything discussed or seen he had thought deeply. First a busy stream of ants we passed on the path attracted his attention; then it would be the burrow of a trap-door spider in a sandy bank; the cryptic attitude of a mantis; or some striking peculiarity in the structure of a flower: about all of these and others he would point something of absorbing interest; to him all Nature was an open book. I remember wondering if even Darwin could have been more interesting and instructive!

Although primarily a lepidopterist, with which order the great bulk of his work was associated, the other orders received at different times a great deal of attention, and on each occasion in which he became interested in a problem affecting them some important and interesting scientific discovery was bound to take place. On one occasion when I called upon him he was deeply interested in the life-cycle of the common earwig, and on the next, the method of oviposition of certain species of the *Tenthredinidae* was being studied, and something previously unknown was pointed out. On my last visit he was most anxious I should ascertain the meaning of a remarkable pupal structure of a Pyralid moth he had detected, and had not time to work out.

Had circumstances led him in the same path as Fabre, he would have been to British Entomology what that fascinating personality was to that of France, but his work would have been far more correct than some at any rate of that of the brilliant Frenchman.

His entomological work was carried out in a thorough manner, and every detail carefully studied and worked out by his acute and logical mind; it was always illustrated profusely with explanatory plates, many of them exquisitely drawn and coloured, and costing large sums of money. His assistance to the Entomological Society by the gift of the beautiful plates by which his papers in the publications were accompanied is attested by a glance through the list of benefactions. Whenever money was required for any purpose in connection with the science he loved so well, an intimation to him was always sure to meet with a generous response.

Although he collected a great many specimens of the Lepidoptera a collection in the ordinary sense of the word was never made; his specimens were used for scientific purposes only, and the choicest of them were cut up remorselessly if science demanded it. They were equally at the service of his friends if required for a scientific object.

It was in connection with his association with the late J. W. Tutt that a vast amount of his entomological work was done. The association of the two was greatly to the advantage of the younger man, for "The Doctor" in his work, as in everything else, was absolutely unselfish: his sole anxiety in dealing with a scientific problem was that it should be solved: it did not signify to him one iota whether he or someone else solved it, provided it *was* solved. Consequently a great deal of the work that appears in Tutt's books his co-worker

was solely responsible for. In justice to Tutt it should be stated that wherever possible he acknowledged the value to him of the work of his friend, of whom he was an enthusiastic admirer. Obviously, however, there was a great deal that was not and could not be acknowledged.

After Tutt's death Dr. Chapman wrote of the association as follows: "Entomology, therefore, owes to Tutt not only Tutt's own work, but also that of his collaborators, which would otherwise not have been done. As one of these I have sometimes felt a grievance that I elaborated material for Tutt when I would have preferred to work on lines of my own selection." His scientific work as an entomologist—and all of his work was scientific—is, in addition to that included in Tutt's books, scattered through the publications of the Entomological and Zoological Societies and the various entomological magazines, to most of which he was a prolific contributor. It is far too voluminous to be mentioned here, except in the case of a few of his more important subjects.

Some of the most valuable and interesting work he ever undertook was the elucidation of the earlier stages of certain species of the *Lycaenidae*, including his share in working out the life history of our own *Lucana atreus*. Most remarkable and characteristic of him was the sagacity with which he discovered that the mysterious winter food of the larva was the larvæ of its ant hosts themselves! It will be remembered he detected this by subjecting to microscopic analysis the contents of the intestinal canal of the only larva obtained by making a journey to Cornwall! Remarkable, too, was the discovery in the south of France of a butterfly new to science and named by him *Callophrys avis*, very similar to *C. rubi*, but abundantly distinct from it.

Dr. Chapman was one of the earliest lepidopterists to appreciate the value of the genitalia in determining nearly allied species and much of his most valuable work is in connection with this subject. Amongst other results obtained by this means was the discovery, or rather re-discovery after the original discovery had long been discredited and forgotten, of a *Lycaenid* butterfly, superficially very near to *Polyommatus icarus*, but which was shown by its genitalia to be much nearer to *Agriades escheri*—a species it is superficially quite unlike. This re-discovery was *Agriades thesites*, Cantener. By the aid of the genitalia he detected the distinctness of *Everes alcetas* from *E. argades*, with which it had previously been included. He also separated *Erebia palareia* from *E. stygne*, and proved that what had hitherto been denominated *Piebeus argus* (*ægon*) consisted of several species.

His researches into the earlier stages of the *Lycaenidae* included the discovery of the larvæ of the following species: *Polyommatus eros*, *Agriades escheri*, *A. thesites*, *Laticlona orbitalis*, *L. pyrenaica*, *Albulina pheretes*, *Lucana alcon* and *L. euphemus*. His work on these, most carefully and minutely described and magnificently illustrated, is to be found in the 'Transactions of the Entomological Society.' His achievements in this group alone, if it had included everything he ever did, would have satisfied most men, and would have stamped him as an eminent lepidopterist.

One of the tasks most useful to the student of British Lepidoptera he undertook was the examination of the genitalia of that difficult group the *Scopariidae*. This is to be found in the 'Transactions the Entomological Society' for 1911, pp. 501-518 and plates xxxv-xliv. The examination did not disclose any new species, but it cleared up several doubtful points, and established as good species some that had hitherto been considered doubtful. A most important paper is entitled "A Revision of the Genus *Erebia*, Based upon the Examination of the Male Appendages" it is to be found in the 'Transactions of the Entomological Society' for 1898, pp. 209-239 and plates v-xvi. It was written in connection with an equally important paper on the genus entitled "A Revision" by Mr. H. J. Elwes, which precedes it. One of his principal earlier papers is the first article published in the first volume of his friend Tutt's magazine, the 'Entomologist's Record,' "The Genus *Acronycta* and its Allies," dealing with all the species in that very composite group, and splitting them up into several new genera. The details are worked out in his usual thorough style, and all the stages are exhaustively treated.

Dr. Chapman was a supporter of the law of priority in nomenclature in the most pronounced sense of the word. He held that a name once given must stand unaltered, no matter if it was ungrammatical, or even misspelt. He would argue, if you once permit alterations there is no tribunal with authority to bid you where to stop. The present writer is of opinion that his views were entirely justified.

He was one of the strongest exponents of the doctrine that we cannot satisfactorily classify species by one character alone, no matter whether it is by the ova, larva or pupa stage, or by structure and markings of the imago, but that we must take everything into consideration. There does not seem to be any reason to doubt but that this view will ultimately prevail.

Dr. Chapman made many expeditions, in search principally of Lepidoptera, to various parts of Europe; prominent amongst these were several journeys to Spain, in which he was accompanied by his friend Mr. G. C. Champion. These expeditions were designedly directed to unworked districts and resulted in several important entomological discoveries; the records he has given of them are amongst the most fascinating of their kind that have ever been written.

He possessed one of the finest and most complete entomological libraries owned by any private individual in this country, practically everything that has been written upon the Palaearctic Lepidoptera being included in it.

"The Doctor" was a very regular attendant at the meetings of the various scientific societies of which he was a member, took much interest in their proceedings, and usually contributed something of weight on the subjects discussed. He was Vice-President of the Entomological Society on half a dozen occasions, and often served on the Council. For some unknown reason, although repeatedly invited, and even pressed, he declined the Presidentship, which had been held by Alfred Russel Wallace, H. W. Bates, Lord Avebury, Lord Walsingham, H. T. Stainton, and most of the great British

entomologists who have lived during the past three quarters of a century, and to which his friend Tutt was elected, though he did not live to occupy the Chair.

He was a Fellow of the Zoological Society, but the greatest honour came in the year 1918, when one of the few Fellowships of the Royal Society that have come the way of entomologists of recent years was conferred upon him.

In his youth he was noted for his great activity and staying power: a walk of forty miles or so was frequently undertaken and enjoyed, and the writer remembers that after he had passed the three score years and ten, which is the allotted life of man, he was still capable of climbing several thousands of feet in the Alps or Pyrenees in search of his beloved butterflies.

It was perfectly marvellous only a few years ago to see him thread the motor traffic in the busiest parts of London, it was his frequent custom to cross a stream of traffic, leaving his friends to keep up with him if they could: very often they couldn't!

At the Entomological Society meetings at Chandos Street he would remain in conversation with friends until he had only just time to catch his train at London Bridge: he would then leave, walking at something nearer four miles per hour than three, and if he thought the occasion required a sharp run would follow, he would rush up stairs and down stairs in the tubes, jump into trains in motion, and do all sorts of things with impunity that would be impossible for most men much his junior.

He had a very happy, genial disposition and was very sociable provided his company was congenial. His conversation in its lighter vein was full of fun and repartee, and sallies were always accompanied by the merriest of twinkles in his shrewd, kindly grey eyes.

In December, 1919, he, who had always enjoyed the very best of health, was attacked by a serious illness. His great strength of constitution and lifelong temperance enabled him to partially recover from this, and he was enabled to continue research work until the day before the end came. His illness was borne with characteristic fortitude and hopefulness.

"The Doctor" rests in the graveyard of the old church at Reigate, amidst the beautiful Northdown country he had wandered over so often and loved so well. May the greenclad turf lie lightly upon him! We shall not see his like again!

To his sisters, the Misses Chapman, who resided with him, we desire to tender our very respectful sympathy.

W. G. S.

WE regret to state that Mr. W. Purdey, of Thanet Gardens, Folkestone, died on January 19th last.

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THE FOSSIL SAWFLIES OF FLORISSANT, COLORADO.*

BY T. D. A. COCKERELL.

THE sawflies, owing to their position near the base of the Hymenopterous series, are of more than ordinary interest to the evolutionist. Primitive Siricoids are known from far down in the Mesozoic, but, except at Florissant, tertiary sawflies are rare. The remarkable Oligocene deposit at Gurnet Bay, in the Isle of Wight, has produced a long series of Hymenoptera, but not a single sawfly. In the famous Miocene deposit at Eningen in Baden a few species have occurred, only three of them described and named. Others are known from the Oligocene of Aix, Brunstatt and in Baltic amber, and the Miocene of Radoboj, but the species are few and for the most part inadequately known. A primitive Siricoid of large size, preserved in the British Museum, has been described from the Eocene of Bournemouth.

It is only in the Miocene of Florissant that we have a fairly representative extinct sawfly fauna. No less than forty-two species have been described, referable to twenty-four genera. Ten of the genera have been regarded as extinct, *Pseudocimbex*, Rohwer, and *Phenacoperga*, Ckll., being placed by Rohwer in a sub-family—Phenacoperginæ. The remaining genera are typical Nearctic and Holarctic types, without any suggestion of Neotropical affinities. They are *Janus*, *Megaxycla*, *Neurotoma*, *Hemichroa*, *Dineura*, *Pteronus*, *Eriocampa*, *Pseudosiobla*, *Macrophya*, *Tenthredella*, *Schizocerus*, *Selandria*, *Cladius* and *Eriocampoides*. It is evident that the modern sawfly genera have come down practically unaltered from the Miocene, but many genera once associated with them have died out.

The genus *Cimbex* and a new species of *Eriocampa* may now be added to the Florissant list, the specimens being in the Colorado Museum of Natural History in Denver. I am indebted to Director J. D. Figgins for permission to describe them. A *Cimbex* larva was reported by Menge as occurring in amber, but otherwise the genus has not been known fossil.

* Sawflies are known as Hymenoptera Phytophaga, but the adults have been found in the act of devouring other insects. Thus at Brainerd Lake, Colorado, I found *Labidia alienata*, Rohwer, preying upon *Bibio nervosus*, Loew (det. Aldrich).

Among the fossils received from Mr. Figgins, I also found the third known specimen of *Megaxyela petrefacta*, Brues (14 mm. long), and the second known example of the caterpillar *Phyllestes vorax*, Ckll.

Cimber vetusculus, n. sp.

Male. Length 17.3 mm., of the usual form, with the stout hind legs projecting from the sides of the abdomen; head, thorax, abdomen and legs black; wings hyaline, suffused with brown in the vicinity of the stigma, veins dark brown. Compared with a male *Cimber americana*, Leach, from Boulder, Colorado, there is little difference except in size. The interradius is more oblique in the fossil, and the second recurrent nervure does not meet the transverse-cubital, but ends some distance before it. I find, however, that some recent specimens have the second recurrent distinctly before the first (morphologically second) transverse-cubital. The scanty hair on the body agrees with *Cimber* and not with *Trichiosoma*.

Wing measurements in microns: lower side of radial cell from interradius to apex, 3170; radial cell on second (morphologically third) cubital, 960; end of second recurrent nervure to first intercubitus (transverse-cubital), 590; end of first recurrent nervure to end of second, 1455; lower side of first discoidal cell, 1690; lower end of basal nervure basad of nervules, 95.

Eriocampa disjecta, n. sp.

Length 11 mm., anterior wing 7 mm.; head and thorax black; abdomen narrow, ferruginous, with the last two segments darkened; wings clear, stigma and nervures ferruginous. Compared with Macgillivray's figure (Proc. U.S. Nat. Mus., vol. xxix, pl. 28) of *E. ovata*, L., it differs thus: radial cell longer and more tapering, its lower side before apex gently curved inward; interradius curved; distance between basal nervure and nervules greater; third cubital cell narrower in proportion to its length; anterior and posterior sides of first discoidal cell nearly parallel, slightly converging above, but basal side (basal nervure) considerably longer than apical; first discoidellian (hind wing) considerably longer.

Among the fossils it is nearest to *E. pristina*, Ckll., which is about the same size and similarly coloured, but the apical part of marginal cell is much more produced than in *pristina*, and there are many other differences in detail. They agree in having the third intercubitus arched inward.

Wing measurements in microns: upper side of radial cell from stigma to apex, 2120; lower side of radial from third intercubitus to apex, 1185; lower end of interradius to third intercubitus, 255; second intercubitus to lower end of interradius, 690; upper side of second cubital cell, 960; depth of stigma, 430; first cubital on first discoidal, 415; second cubital on first discoidal, 350; second intercubitus to second recurrent, 400; basal nervure, 1120; apical side of first discoidal, 605; first discoidal on submedian, 445; first discoidal on first brachial, 620.

THE GENUS "*AMBLYPODIA*" AUCTORUM (DE NICEVILLE, MOORE, SWINHOE, ETC.), NEC HORSFIELD (LEP. RHOP.).

BY N. D. RILEY, F.E.S., F.Z.S.

(Continued from p. 29.)

(g) *H. n. batjana*, ssp. nov.

♂. Upperside: Somewhat similar to *plateni*, the distal black border being very broad; its inner edge, however, is very much curved (not nearly straight as in *plateni*), and it does not extend at all into the basal portions of areas 4, 5, 6 or even 7. On the hind wing the blue reaches partly into area 6. The underside is distinctly greenish.

B.M. type No. Rh. 205, ♂; Batchian (*Dr. Platen*), ex Godman and Salvin Coll.

Very distinct from the next species (*H. annetta*), which was also obtained from Batchian by Dr. Platen. Its genitalia are decidedly of the *narada* type.

(h) *H. n. confusa*, ssp. nov.

♂. Upperside: The blue is much thinner and paler and is restricted on the fore wing to the cell, the proximal quarter of area 2, the proximal two-thirds of area 1*b* and the whole of 1*a*; on the hind wing it occupies the cell, the bulk of area 2 and most of the proximal halves of areas 3 to 6. The underside is light, glossy purplish brown, the diagonal line prominent, very wavy.

B.M. type No. Rh. 206, ♂; Macassar, ex Hewitson Coll.

This specimen very closely resembles the next species in colour and markings and in the great reduction of the blue areas of the wings; in fact, it stood as *annetta* in the collection. Its genitalia, however, show it unquestionably to belong to *narada*.

(3) *HORSFIELDIA ANNETTA*, Staud.

The oblique transverse line on the underside of fore wing in this species does not run to the apex, but towards the costa some little way short of the apex, though seldom, if ever, actually reaching the costa.

(a) *H. a. annetta*, Staud.

Amblypodia annetta, Staud.

Typical *annetta* was described by Staudinger from examples sent him by Dr. Platen, and he gives an excellent figure of it (Ex. Schmett, pl. 96). It is characterised by the small area occupied by the rather *purplish* blue of the upper side, and its extremely dark underside, against which the grey marginal and submarginal bands of the hind wing show up very conspicuously. Any of these characters will at once separate it from *H. n.*

batjana, the Batchian race of *narada* which was also obtained by Dr. Platen.

Only known from Batchian.

(b) *H. a. elga*, Frühst.

Described from Obi. It is said to have a more brilliant and larger light blue basal area to all wings, and a light red-brown underside. It is unknown to me.

(c) *H. a. anna*, Staud.

The male has less and much lighter blue than typical *anna* on the upperside. On the underside the grey bands on hind wing are slightly more prominent, and the diagonal line which runs across both wings is very wavy and comparatively conspicuous; in typical *annetta* it is scarcely visible. The ground-colour of the underside is very uniform dark brown.

This race was described from Amboina and Saparua. It is in the British Museum from Ceram only.

(d) *H. a. jabiana*, Frühst.

This race was described from a solitary female from Waigiu. It is represented by one female from Salwatty in the British Museum.

It is said to "connect *annetta* with *faisina*" (from the Solomons!), than which the "blue of the upperside is rather darker and more sharply defined. Underside: Ground-colour light grey, with a broad red-brown wavy median band. Both wings with a complete black submarginal band which, on the hind wing, is proximally strewn with whitish-grey. The ante-marginal brown spots of the hind wing more delicate than in *faisina*, the subanal spots grey, instead of dull yellow, and larger."

(e) *H. a. eberalda*, Frühst.

All the males of this race that I have seen are very brilliant blue above, the blue being of much the same shade as in *anna*, rather light (very much lighter than in typical *annetta*), and of considerable extent; underside very dark purplish-black, on which the wavy diagonal line is barely visible; of the grey markings towards hind margin of hind wing the inner series is the more prominent. The underside may, however, be bright red-brown, in which case the normal markings are quite prominent. Frühstorfer describes the female as being "above like *narada fara*, but darker blue, basal coloration of the hind wing almost reaching the margin at anal angle. Underside rather lighter, more reddish-brown, more richly sprinkled with grey."

Described from the high Forest of Kabenau, German New Guinea; occurs also in Dutch New Guinea, Kaju-mera, Fak-Fak, and probably throughout New Guinea.

(f) *H. a. faisina*, Ribbe.

Based on a single female taken on Faisi Island in the Bougainville Straits, Solomon Isles. It is remarkable for the very light distal half of both wings below, and the pronounced marginal markings on the hind wing. The upperside appears to agree quite well with *a. anna* female. It is not represented in the British Museum; it probably is a good local race.

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 35.)

Aglais urticae.—Larvæ abundant at Lochinver. The imagines bred are of good size and extremely bright in colour, the tawny disc of the wings being especially bright. The most striking feature in this race is, however, the brilliance and size of the blue blotches in the dark external band; this character, especially as it applies to the superiors, is more pronounced than in any specimens I possess either of British or European origin.

Pyrameis cardui.—One or two visitors at Lochinver in June.

P. atalanta.—One example around nettles at Inchnadamph.

Argynnis aglaia.—Common at Lochinver, less so at Inchnadamph. Some of the females resemble south of England specimens, and some are very dark.

Brenthis selene.*—Fairly common.

Hipparchia semele.—Common at Lochinver and on the Island of Soyea, but very difficult to capture in consequence of its wariness and the rough character of the ground it frequented; very fine bright examples of race *scota* Verity.

Epinephele jurtina.*—Unquestionably the most interesting butterfly met with. My first specimen taken at Inchnadamph on July 5th gave me quite a shock. A large, apparently jet black butterfly got up and flew with a very *Erebia*-like flight; I wondered if I had come across *E. ligea*, which certain people consider a not impossible species to occur in western Scotland. The wind carried the insect some half a mile before I could capture it and solve the mystery. I found it was a very dark male *E. jurtina*, and afterwards captured one female, very much like our south of England form, except that the dark portion of the wing was darker than obtains in that race; the fulvous patch was confined to the disc of the superiors. At Lochinver the form is a really astonishing one if one considers the geographical position. Both males and females are very

strongly coloured, and in the latter the fulvous patches spread over almost the entire superiors, and there is even a band of this colour across the inferiors. Some of the specimens resemble very closely examples I have from Spain and southern France, and are practically identical with *ab. hispulla*, Hüb. I am aware, of course, that the Scilly Islands produce a very similar form, but Lochinver is several hundreds of miles further north!

Coenonympha tiphon.*—Common throughout the district on bogs; the usual highland Scotch form.

C. pamphilus.*—Not infrequent at Inchnadamph; hardly seen at Lochinver. The examples brought home are very typical of southern British specimens, and do not show any approach to race *scota* Verity.

Polyommatus icarus.*—Fairly common at Lochinver and on Soyea, less so at Inchnadamph. The examples from the latter locality (males only) show distinct traces of black spots on the uppersides of the inferiors; this does not apply to the Lochinver specimens. The males and some of the females of these are of an extremely bright blue, almost rivalling *Agriades bellargus* in this respect. The blue coloration in some of the females is extremely pronounced. The undersides are typical. The size is, as in most Scotch specimens, larger than southern British.

Cerura furcula.—Larvæ beaten by Mr. Whittle from willow at Lochinver.

Notodonta dromedarius.—Larvæ on birch; Mr. Whittle; Lochinver.

Pugaca pigra.—Larvæ extremely common on willow at Lochinver, at the end of July.

Palimpsestis or.—Larvæ on aspen at Lochinver; not uncommon.

P. duplaris, var. *obscura*, Tutt.—Common at sugar.

Polyplocia glaucicornis.*—Larvæ scarce in both localities, imagines not yet bred.

Trichiura crataegi.—We each obtained a larva at Lochinver on willow. Mine has not emerged.

Lasiocampa quercus, var. *callunae*.*—Larvæ on heather.

L. rubi.—Larvæ at Lochinver.

Saturnia pavonia.*—Larvæ common on heather at Lochinver, less so at Inchnadamph.

Drepana lacertinaria.—Larvæ at Lochinver; Mr. Whittle.

Parasemia plantaginis.*—At each locality. Scarce.

Acronycta menyanthidis.—One larva on *Myrica gale* at Lochinver, now a pupa.

A. euphorbiae, var. *myricae*.—One ichneumonid larva at Lochinver.

A. rumicis.—At sugar, the type form.

Agrotis strigula.—Common amongst heather at dusk.

Noctua augur.—At sugar.

N. brunnea.—Common at sugar; a beautiful reddish form, = var. *rufa*, Tutt.

N. c-nigrum.—At Lochinver; Mr. Whittle.

N. primulae, Esp., = *festiva*, Hb.—Common at sugar. The specimens were reddish-brown unicolorous forms showing little variation.

N. rubi.—Common at sugar.

N. xanthographa.—One dark example at sugar, July 14th—a very early date.

N. plecta.—Common at sugar; the examples have the costal streak darker than is the case in southern specimens.

Triphaena comes.—Two examples only at sugar, one a bright pale red = var. *rufescens*, Tutt, the other = var. *ochrea*, Hufn.

T. pronuba.—Common at sugar. Various forms; particulars not noted.

Mamestra pisi.—One example only at sugar, = var. *pallida*, Tutt.

Eumichtis adusta.—At sugar; = the type form.

Bombycia viminalis.—Larvæ not uncommon on willows at Lochinver; the resultant imagines are very beautiful and highly variegated forms perhaps near *intermedia*, Tutt, but I have never seen similar specimens.

Hyppa rectilinea.—Scarce at sugar; very beautiful dark examples of var. *virgata*, Tutt.

Miana fasciuncula.—Scarce at sugar; the red form = type, and var. *cana*, Stgr., and intermediates.

Xylophasia rurea.—This, the most interesting *Noctua* met with, was common at sugar; a very variable series was taken, consisting of the greyish-white type, and the following aberrations: *ochrea*, Tutt; *flavo-rufa*, Tutt; *alopecurus*, Esp.; and *nigro-rubida*, Tutt. Of this form Tutt writes ('British Noct. and their Varieties,' vol. i, p. 81): "I have only seen this variety from the Island of Lewis."

X. lithoxylea.—One example at rest on a post in the daytime, Lochinver.

X. monoglypha.—This variable species was abundant at sugar, but the forms were not so dark on the whole as one expects to be the case in examples from Northern Scotland. I saw, perhaps, half a dozen black specimens, and the great bulk were the light southern form = the type; there was a considerable number of ab. *brunnea*, Tutt. I brought away two examples which do not agree with anything described by Tutt, or that I have seen elsewhere. They are very handsome, extremely dark variegated forms, but the ground-colour is a rich intensely dark brown. Very similar to that of *Crymodes exulis*, var. *assimilis*, but even more intense and brilliant than obtains in that form.

Polia chi.—Mr. Whittle reported this species from Lochinver; the grey type only.

Euplexia lucipara.—Common at sugar.

Hydraecia micacea.—Reported by Mr. Whittle.

Rusina tenebrosa.—Common at sugar; var. *obscura*, Tutt, only.

Taeniocampa gothica and *T. stabilis*.—Larvæ of both these species were beaten commonly at Lochinver.

T. gracilis.*—Larvæ common on *Myrica gale*.

X. silago.—Reported by Mr. Whittle; Lochinver.

Calocampa vetusta.—A larva found on *Myrica gale* at Lochinver.

Anarta myrtilli.—Flying over heather at Lochinver.

Prothymnia viridaria.*—Not common.

Plusia pulchrina.—Lochinver; *P. gamma*,* common.

P. interrogationis.—At Inchnadamph; very local, and not common.

Hyppia proboscidalis.—Lochinver; Mr. Whittle.

Acidalia fumata.*—Common.

Ortholitha limitata.—Lochinver.

Odesia atrata, *Anaitis plagiata*.—Common locally at Lochinver.

Cheimatobia brumata.—Larvæ; Lochinver.

Lygris testata.—Bred from willow; Lochinver.

L. populata.*—Not common, and strictly typical.

Cidaria fulvata.—Lochinver; Mr. Whittle.

C. corylata.*—Not common; the type only seen.

C. truncata.*—Perhaps the most abundant Geometer. Very common on rocks and trees everywhere; the forms consisted of the type, ab. *perfusca*, Haw., ab. *centumnotata*, Schaulz., and one or two others.

C. immanata.—Lochinver; Mr. Whittle; the type form only.

C. miata.—Lochinver; bred from birch.

Thera obeliscata.—Lochinver; common.

T. cognata.—This species was reported as common by Dr. Beveridge at Lochinver. We searched in every direction for bushes of juniper but for a long time without success. Eventually, however, I located three or four small ones on a hill behind the Culag Hotel, and on these the larvæ were common. I presume the juniper has been almost grazed out of existence.

Coremia munitata.*—A few examples only.

C. ferrugata.*—Very beautiful forms of ab. *spadicaria*, Haw., were not uncommon.

C. designata.—Lochinver.

Amoebe olivata.—Lochinver.

A. viridaria.*—Beautiful brilliant green forms, very abundant.

Malenydris salicata.—Lochinver; not common.

M. didymata.*—Abundant.

Venusia cambrica.*—Not common on trunks of mountain ash.

Entephria caesiata.*—Abundant; very light forms.

E. flavicinctata.—Lochinver; not common. Its usual food-plant, *Saxifraga aizoides*, is not found there, and the larval pabulum was no doubt *Sedum* sp.

Xanthorhoë montanata.—Common and very variable; some of the forms resemble ab. *shetlandica*, Weir.

X. fluctuata.—I only saw one example at Lochinver; this is a very dark example of ab. *neapolisata*, Mill.

X. galiata.—One example only; Lochinver, Mr. Whittle.

X. sociata.—Abundant; not showing any approach to the Hebridean form *obscurata*, South.

X. tristata.—Lochinver, not common; a black and white form resembling the Yorkshire specimens, and not the smoky brown ordinary Scottish form.

(To be continued.)

NOTES ON BRITISH NEUROPTERA IN 1921.

By W. J. LUCAS, B.A., F.E.S.

As Neuroptera were not persistently worked for during 1921, not many records were made, and those that follow were often noted chiefly for the sake of the dates.

Alder-flies.—Two males of *Sialis lutaria*, Linn. were taken in the New Forest on May 18. The dusky *S. fuliginosa*, Pict., which is a less common and somewhat later insect, I met with first on June 1 at Blackwater in the New Forest. South took *S. lutaria* on June 1 at Harefield in Middlesex, and on the 14th at Padworth in Berks.

Brown Lacewings.—My first capture of the antlion-like *Osmylus chrysops*, Linn. was made at Queen's Bower in the New Forest on June 5, though I possibly saw one in the Forest about three weeks earlier. Two or three further examples were met with near Blackwater on June 8. These were all I saw during the season of an insect which I hoped to meet with more freely. *Hemerobius micans*, Oliv. was taken near Withybed Bottom at Stony Cross Plain in the New Forest on Aug. 4. My first experience with *H. stigma*, Steph. in 1921 occurred on Jan. 13, when one was captured flying on Esher Common, Surrey; another was taken there on Jan. 24. About twelve were secured on Jan. 30, when I visited the Common again with C. L. Withycombe; these were obtained by tapping small Scotch Firs over a beating-tray. On Feb. 4 a male was taken on Esher Common. On Feb. 21 two were beaten from Scotch Firs on the same common, and on March 10 one only was captured there in the same way. On March 22 I visited Stanmore Common, Middlesex, with South. Only one Conifer was met with, but from this a few examples of

Heemerobius were beaten; though of a rather dark and well-marked form, I take them all to be *H. stigma*.

On April 4 I obtained a *Heemerobius* larva from a Scotch Fir on Esher Common. In colour the thorax was bluish-white, with two small semilunar black marks, one on each side of the pronotum. The abdomen was yellowish-white with two longitudinal rows of dark blotches—one on each side—and a fine mid-dorsal black line. The larva was placed, with some Scotch Fir aphides, in a glass-bottomed box, where it began to spin up on April 6. Though the pale yellow cocoon, made between two "needles," was very thin, I could not tell when the larva became a pupa, but I think not at once. A nice imago of *H. concinnus*, Steph. appeared during the daytime on May 2. The pupa, of course, leaves the cocoon before the final change, and in this case did so without revealing clearly the place of exit. The pupal skin was a very perfect one. South captured this species at Padworth on June 12.

Green Lacewings.—*Chrysopa tenella*, Schn. was captured at Brondesbury, Middlesex, on June 1 (South). *C. vulgaris*, Schn. was met with three times in the New Forest—on July 15 and 25 and on Aug. 31. Of *C. prasina*, Ramb. (= *aspera*, Wesm.) one was taken at Esher Common on June 14 and two on June 22. Withycombe took his first specimen of the blue-green species, *C. perla*, Linn. on May 21; I captured specimens on June 16 in Juniper Valley, Boxhill, Surrey. South secured two *Nothochrysa capitata*, Fabr. on or near Guelder Rose, *Viburnum opulus*, Linn. at Padworth on June 12.

Dusty-wings.—I have but one note on these tiny Neuroptera with powdered wings—a capture of *Semidalis aleurodiformis*, Steph., on the wing at Ramnor in the New Forest on June 5.

Scorpion-flies.—My first experience of the genus *Panorpa* was on May 23, when a female *P. germanica*, Linn. and a teneral female *P. communis*, Linn. were captured in the New Forest. By the 24th they seemed to be common, and a male *P. communis* was taken, a male *P. germanica* being secured on May 29. On May 31 *Panorpas* appeared to be very plentiful in the Forest, as they were again on June 5. Their flight is usually clumsy and of short duration, often nearly in a straight line. They quickly fly off, or drop, when disturbed. On July 25 at Denny Bog a female *P. communis*, a large and bright specimen but with wing-tips damaged, when disturbed went down into the rank herbage, and being followed tried persistently to hide in the deep grassy growth at the base of the taller herbage—a frequent proceeding of this species and its congener *P. germanica*. South took males of *P. communis* and *P. germanica* at Padworth from June 12–14.

Kingston-on-Thames;
Feb. 4, 1922.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ
(OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 3.)

PROCTOTRYPES, Latreille.

Proctotrupes, Latr., Prec. Car. Gen. Ins., 1796, p. 108;
Serphus, Schr., Schrift. Berl. Ges., i, 1780, p. 307 (*nec. Syrphus*,
Fab., 1775).

This genus as restricted nowadays occurs in Africa, Australia, Chili, and both North and Central America; I have seen none from India. It has been divided into three subgenera by Kieffer, who considers them probably worthy of generic rank; I do not. The species are very distinct *inter se*, and easy of determination; in fact, until the structure of the claws be examined they are less different from those of *Exallonyx* than from each other. They appear to occur ubiquitously and with no reference respecting situation; I have never, or extremely rarely, found them upon flowers, but usually by beating boughs and sweeping rank herbage; though most frequently they are attracted by honey-dew upon the leaves of oaks, and particularly of limes.

TABLE OF SPECIES.

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| (10). | 1. | Abdominal petiole not visible from above: metanotum smooth with more or less distinct areæ; terebra filiform [CRYPTOSERPUS, Kieff.]. |
| (9). | 2. | Radial cell as long, or nearly so, as stigma. |
| (6). | 3. | Metanotum basally trifoveate; hind calcar short, always straight. |
| (5). | 4. | Pronotal tubercles small; metanotum without areæ. |
| | | 1. <i>brevimanus</i> , Kief. |
| (4). | 5. | Pronotal tubercles acute; metanotal areæ entire. |
| | | 2. <i>laricis</i> , Hal. |
| (3). | 6. | Metanotum not foveate; larger hind calcar long, often arcuate. |
| (8). | 7. | Radial nervure straight; notauli slightly indicated. |
| | | 3. <i>longitarsis</i> , Th. |
| (7). | 8. | Radial nervure curved; notauli utterly wanting. |
| | | 4. <i>aculeator</i> , Hal. |
| (2). | 9. | Radial cell much shorter than stigma; body squat. |
| | | 5. <i>parvulus</i> , Nees. |
| (1). | 10. | Abdominal petiole distinct, visible above; metanotum entirely sculptured. |
| (16). | 11. | Propleuræ usually striate; abdomen or second segment entirely red; terebra filiform, at least half abdominal length [SERPHUS, Kieff.]. |

- (13). 12. Metathorax reticulate; terebra apically deflexed.
6. *gravidator*, Linn.
- (12). 13. Metathorax longitudinally striate; terebra evenly arcuate.
- (15). 14. Wings aborted; large hind calcar straight.
7. *devagator*, Oliv.
- (14). 15. Wings fully developed; large hind calcar arcuate.
8. *gladiator*, Hal.
- (11). 16. Propleuræ smooth, basally punctate; second segment black or piceous, rarely apically rufescent; terebra gradually attenuate throughout, shorter than half abdomen [PHÆOSERPHTUS, Kieff.].
- (20). 17. Metathorax centrally sulcate throughout its length.
- (19). 18. Head transverse, as broad as thorax; cheeks dentate.
9. *buccatus*, Thoms.
- (18). 19. Head globose, shorter than thorax; radial cell acute.
10. *elongatus*, Hal.
- (17). 20. Metathorax centrally carinate throughout its length.
- (26). 21. Frons apically convex; radial cell fully length of stigma.
- (25). 22. Metanotum evenly rugose; discal nervures indicated.
- (24). 23. Wings normally developed; abdomen entirely black.
11. *calcar*, Hal.
- (23). 24. Wings aborted; central segments often brunneous.
12. *curtipennis*, Hal.
- (22). 25. Metanotum rugose, basally smooth; discal vein wanting.
13. *seticornis*, Th.
- (21). 26. Frons produced; radial cell much shorter than stigma.
- (28). 27. Metathorax tuberculate; head globose; legs infuscated.
14. *fuscipes*, Hal.
- (27). 28. Metathorax mutic; head distinctly transverse; legs rufescent.
- (32). 29. Frons tuberculiformly prominent between antennæ.
- (31). 30. Head transverse; flagellar joints long, not cylindrical.
15. *pallidipes*, Jur.
- (30). 31. Head and flagellar joints quadrate, latter cylindrical.
16. *hyalinipennis*, Morl.
- (29). 32. Frons deplanate and not prominent between antennæ.
- (34). 33. Stigma twice length of radial cell; discal nervures wanting.
17. *micrurus*, Kieff.
- (33). 34. Stigma thrice length of radial cell; discal nervures indicated.
- (36). 35. Legs of normal length; metanotum evenly rugulose.
18. *viator*, Hal.
- (35). 36. Legs elongate; metanotum triangularly smooth basally.
19. *Chittii*, Morl.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ORDER NEUROPTERA.—It would be of much interest to myself and some other entomologists in New Zealand if a brief statement were made through the pages of the 'Entomologist' as to what extent the breaking up of the old Order Neuroptera into a number of new Orders is generally approved by British entomologists. In the 'Cambridge Natural History' the Order Neuroptera is dealt with in the broad sense, and is subdivided into families in accordance with the system followed by most of the older entomologists. Recently, however, attempts have been made to raise most of these families to ordinal status and to give them new names. For example, we find the Perlidæ spoken of as the Order Perlaria; the Ephemeridæ as the Order Plectoptera; the Sialidæ as the Order Megaloptera; the Panorpidæ as the Order Mecoptera, and so on. The Phryganidæ have of course long been regarded by many writers as a distinct order, the Trichoptera and the Dragonflies as another Order—the Odonata, although even in these cases opinion does not appear to be by any means unanimous. It is almost impossible for workers out here to discriminate between the views of one or two special students and those of entomologists in general, and hence some authoritative statement on the questions I have raised would be very welcome. Incidentally, I gather from the writings of Mr. Lucas in your pages that the old Order Neuroptera has not been entirely abandoned, and also that the old family designations appertaining thereto are still in current use amongst British entomologists.—G. V. HUDSON; Wellington, New Zealand.

[In vol. xlii, 1909, will be found an article by Dr. D. Sharp, giving a scientific scheme of the natural orders of insects, and since that time it has been the one employed by the 'Entomologist' in its index, etc. In this scheme the heterogeneous Neuroptera of Linnæus is broken up into its natural divisions. This scheme is in the main that proposed by Dr. Shipley in 'Zool. Anz.', xxviii, 1904, and, as it is made use of in Prof. Sedgwick's 'Text-book of Zoology,' vol. iii, 1909, it has practically the sanction of Cambridge biologists. Dr. Sharp, we know, would like to amend the list of Orders in his 'Insecta' if only the publishers would produce a new edition. Since 1909 Mr. Lucas has always used the term Neuroptera in its restricted sense, and we would very much like all our contributors to do the same. We append the list of Orders:

APTERYGOTA:

Protura	}	Wingless insects supposed to have descended from wingless ancestors.
Collembola		
Campodeioidea		
Thysanura		

ANAPTERYGOTA:

Mallophaga	}	Wingless insects whose ancestors were probably winged.
Anoplura		
Siphonaptera		

EXOPTERYGOTA :

Orthoptera
Plecoptera*
Psocoptera
 Zoraptera
Isoptera
Embioptera
Ephemeroptera
Paraneuroptera
 = Odonata
 Thysanoptera
 Hemiptera

Winged insects whose wings develop outside the body.

ENDOPTERYGOTA :

Neuroptera
Trichoptera
 Lepidoptera
 Coleoptera
 Strepsiptera
 Diptera
 Hymenoptera

Winged insects whose wings arise as invaginations of the hypodermis, and for a time project within the body.

It will be noticed that Protura and Zoraptera have been added to the list of 1909, and Dr. Chapman suggests a small Order, Zeugoptera, between the Trichoptera and Lepidoptera. Some biologists prefer to separate the earwigs from the Orthoptera as Dermaptera; and some would still further reduce the Neuroptera by breaking off the Scorpionflies, etc., at one end, as **Mecoptera**, and a group containing the alderflies and others, as **Megaloptera**, from the other.—W. J. L.]

LEUCANIA VITELLINA REARED FROM OVA.—In October, 1920, Mr. L. W. Newman sent me some ova of *L. vitellina*. These hatched the same month and I placed the larvæ on *Poa annua*. I kept them in my sitting-room, where there was generally a fire every evening. They did not attempt to hibernate, but fed right through the winter. As they got larger I moved them into a large pan in which I put a pot of Cocksfoot grass. I had potted up a number of small tufts of this grass, which I brought on in the greenhouse, and I used to change the food every other night. When forcing this species in a dry room it is advisable to have the grass slightly damp, as when changing their skins the larvæ have difficulty in getting out of them. It is not a good plan to sprinkle them with water otherwise they go off. The grass, being grown in a damp greenhouse, is moist enough. They had all pupated by the middle of April, 1921; the first emergence was on May 18th and the last on June 8th. They always emerged in the early morning. Almost the whole brood were males and all large specimens.—H. McD. EDELSTEN; Oakhurst, Balcombe Road, Haywards Heath.

EARLY AND LATE DATES FOR LEPIDOPTERA.—The following dates of appearance of certain species of Lepidoptera in this district during the past abnormal season may be of interest: February 16th, *Selenia bilunaria* and *Eupithecia pumilata* (the last specimen seen of the

* The components of the Neuroptera (Linn.) are in block type.

latter species was on October 21st—a freshly emerged one). February 24th, *Larentia multistrigaria*; March 21st, *Pieris rapæ*; March 24th, *Pararge egeria*; April 4th, *Spilosoma fuliginosa*; April 22nd, *Melanthis ocellata*. A specimen of *Bapta temerata* was taken on October 21st and *Vanessa atalanta* was observed on the wing on December 5th and 9th. *Caradrina ambigua* was abundant at sugar during August and September, and several *Colias edusa* were seen in the autumn.—E. D. MORGAN; 27, Sanford Crescent, Chelston, Torquay.

ADDITIONS TO GLAMORGAN LIST OF LEPIDOPTERA.—A specimen of *Lithosia griseola* was taken on July 19th last year at Llanishen. Possibly this insect has been overlooked owing to its similarity to *L. lurideola*. It seems rather remarkable that the first example of *Eupithecia linariata* to be met with locally should have turned up at light on September 2nd—an unusual date for this species to be on the wing. Amongst a number of “micros” submitted to Mr. F. N. Pierce for identification in connection with the Faunistic Survey of the County the following were some of the more interesting new records: *Peronea ferrugana*, *P. hastiana*, *P. logiana*, *Rhæodia caudana*, *Ephippiphora inopiana*, *Pædisca solandriana*, *Stigmonota perlepidana*, *Adela rufimitrella* and *Depressaria angellicella*, all from Llanishen.—F. NORTON; 69, Whitechurch Road, Cardiff.

COLLECTING BY POWERFUL LIGHTS, ETC.—During the past two years I have worked this favoured district with great determination, collecting a large series of insects and filling a bulky note-book with daily observations. Most of the work has been carried out with the aid of a car and powerful headlights at Grange, Witherslack and Holker Mosses, Bigland and Cartmel Fells, and Newly Bridge. During 1921 a couple of 400-candle-power petrol vapour lamps were purchased. In regard to weather, nights varied very much. Many hot, still, muggy nights produced very little; on the other hand one wild night of westerly lashing rain gave us a “great night.” Fog is worse than an east wind. Some species, notably *D. coryli* and *G. papilionaria*, which most local collectors consider scarce, came in great numbers. *P. leucographa* and *T. miniosa*, both taken in fair numbers, are apparently a new record for the district. *D. chaonia* occurs at Bigland and *N. trepida* occurred twice on the very stormy night, May 11th, 1921. *L. polycommata* is evidently well established here. *L. viretata* is much more local in my experience, being only taken in 1920. *P. duplaris* shows great variation. Many insects absolutely ignore light; others, on two nights apparently similar, act very differently, on the one crowding right up to the light, on the other never coming within 15 feet. *Plusia moneta* was taken at dusk in 1919 and 1920 upon some eight occasions, always hovering over *Delphinium* or *Viola*, but none were seen last year. Is this a “farthest north” record? *B. bimaculata* is a scarce insect in Witherslack woods which apparently ignores light altogether. I took *M. alternata* at rest on a Pine tree at Holker, May 28th, 1920. It is known to occur at Witherslack, but is this often noted in Lancashire? The dark sepia black forms of *X. monoglypha* occur frequently (at sugar). *A. nigra*, common at sugar. *E. undulata* was

taken by myself at Grange in August, 1900, but during the past two years of hard collecting has not been seen. *A. unitaria* apparently is scarce here. My only record is July 27th, 1920, Grange. Also *A. luteata* June 17th, 1921, Holker. It is frequently necessary to get a car into apparently impossible places or to back a mile, but a doctor's car in the Lake District has to go almost anywhere, sometimes even through flowing tidal waters, or through timber-felling tracks, and I can strongly suggest that others should follow our example and try "mothing by motor." (N.B.—Witherslack is in Westmorland. Other localities all North Lanes.).—(Dr.) RICHARD C. LOWTHER; Fernleigh, Grange-over-Sands.

EMMELESIA MINORATA, ETC., AT GRASSINGTON.—I paid a short visit to Grassington on July 27th last. The day was fine but overcast; in consequence *Erebia ethiops*, though fully out, was not flying freely, but several nice specimens were taken. My chief object was to discover if *Larentia flavicinctata* still occurred in its old haunts, as it had not been seen for some time; however, it was still found on the limestone rocks, but was not numerous, about a dozen being taken. Returning over the high ground above the woods, *Aphelia osseana* was flying freely, but the best thing taken was *Emmelesia minorata*. The first specimens taken were sitting on the walls; they flew off quickly as one approached and were hard to secure, but a week later, August 3rd, they were flying over the short grass, settling on the stems or sometimes on the bare ground; this was about 5 o'clock in the afternoon—probably this is the time of their natural flight, which is very much like that of *E. albulata*. I believe this is the only recorded Yorkshire locality. *Larentia olivata* was common in the same locality, but the only other interesting insect caught was a fine *Cerostoma sequella* taken from a tree-trunk.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

NON-ATTRACTIVENESS OF ELECTRIC LIGHT: A QUERY.—Can anyone offer an explanation of a curious phenomenon which has very much puzzled me? In pre-war days the stout electric lamps here attracted a large number of moths. There was one arc lamp in particular, near by, which shed its light upon a house with a cemented front, which always produced an abundance of visitors. On the house front I would often find as many as a dozen moths late in the evening, including such species as *E. autumnaria*, *S. fagi*, *X. aurago* and *C. xerampelina*. During the war the lighting was reduced to a minimum, in consequence of which no more moths were seen at the lamps. Since the war, however, the old lighting has been restored, though with different lamps. These seem to possess absolutely no power of attraction. Not a single moth is ever found now at any of our lamps. During 1921 I only saw one moth resting on the wall of the house mentioned, and that was a ♂ *H. brumata* at the beginning of December. What is the cause of this? I have asked the electrical engineer if he can explain, but he cannot. I find the old lamps were called "Flame Arcs"; the present ones, which give a rather whiter light than the old ones, are known as "gas filled" or "half Watt" lamps. It seems to me that there must be some particular ray which was present in the old lamps that is absent in

the light produced by the present ones which was the cause of the attraction, but up till now I had been under the impression that all bright lamps were equally attractive to moths. I shall be glad if anyone can explain. One cannot imagine any change in the sensitiveness of the moths to light.—(Rev.) J. E. TARBAT; Fareham, Hants.

LEPTOGRAMMA LITERANA IN YORKSHIRE.—In reference to Mr. Sheldon's invaluable contribution to the life-history, variation and distribution of this species, it may be well to put on record that I have taken this species very sparingly over a number of years in the Kildale district of North Yorks, never more than two or three specimens in a season, all in the spring months of February, March and May; all on or about Oak except one specimen beaten out of Birch. The specimens taken included the type and var. *squamana*, the latter probably being the more frequent.—T. ASHTON LOTHOUSE, F.E.S.; Linthorpe, Middlesbrough.

BUTTERFLIES OF THE VIENNA DISTRICT.—Being in Vienna during the latter part of the summer of 1920 I had the opportunity of spending my Sundays in the surrounding country. The neighbourhood is renowned for the beauty of its scenery and the variety of its Lepidoptera, and though one's observations were necessarily confined to the day-flying species, the results may possibly be of interest to your readers. On July 25th, a very hot, sunny day, I climbed the slopes of the Kahlenberg, which overlooks the Danube west of Vienna; the grass had not been cut in the meadows, which were a mass of wild flowers and teemed with insect life. The following were among the many species noticed: *Papilio machaon*, about six specimens more or less damaged; *Colias hyale*, a fair number, recently emerged; *Melanargia galatea*, mostly damaged; *Satyrus dryas*, a handsome, strong-flying species of the Satyridæ, several in good condition; *Ceronympha iphis*, first cousin to *C. pamphilus*. The following "blues," recently emerged, were in large numbers, and formed a lovely sight in the brilliant sunshine: *L. corydon*, *C. minimus*, *L. ægon*, *L. meleager*, a large sky-blue species; *L. damon*, the male of which is the colour of moonlight on water, with black edging, the female dark brown, both sexes having a long white streak on the underside of the hind wings. Of day-flying moths the following were seen: *Zygæna carniolica*, a pretty species of the Burnet tribe, in very large numbers, five or six on every thistle head; *Z. filipendulæ*, *O. limitata*, *O. mœniata*, *O. bipunctaria*, the latter in enormous numbers, together with var. *gachtaria*, *P. gamma*, *E. glyphica*. On August 1st, a warm, cloudy day, I noticed the following in the woods and adjoining meadows of the Wienerwald, near Mauer: *D. paphia*, rather worn specimens; *L. sinapis*, *P. egeria*, *L. icarus*, *L. corydon*, *L. bellargus*; *L. ægon*; *Chrysophanus dorilis*, belonging to the "copper" family, the male being greyish-brown with black dots and the female somewhat similar to the female of *C. virgaureæ*; *H. malvæ*; *A. sylvanus*; also one specimen of *C. hera* sitting on a thistle. August 8th, a fine and very hot day, was spent in the pine woods above Baden, in the Wienerwald, at a height of about 800 feet above sea-level, and the following species were noticed, either flying among the pine trees or on the grass or heathery clearings on the side of the

hills: *P. podalirius*, one specimen; *L. sinapis*; *P. egeria*; *P. megera*; *M. galathea*; *E. athrops*, freshly emerged and in large numbers; *S. semele*; *E. janira*; *S. briseis*, a fine large species of the Satyridæ; *A. paphia*; *Lycena hylas*, a member of the "blue" family very prettily marked on the underside. Several specimens of *C. hera* were found sitting on hazel, and I also noticed *E. atomaria*, *C. clathrata* and *P. coracina*. On August 15th we had a day's partridge shooting in the plains south-east of Vienna, over open fields of grass and maize, intersected here and there by streams lined with scrub and small woods. The weather was sunny and very hot, and the following were noticed: *P. daplidice*, freshly emerged and in large numbers; *Coletus hyale*, very plentiful, including variations in marking and colouring; *C. edusa*; *C. chrysothème*; *C. myrmidone*, all plentiful. I took one specimen of the pale female variety of the latter, which much resembles var. *helice* of *edusa*, and is far from common in Austria; *L. sinapis*, including several entirely devoid of the black tip to the fore wing; *S. briseis*; *S. hermyone*; *A. lathonia*; *A. dia*, in large numbers, freshly emerged; *M. athalia*, *P. cardui*; *L. bellargus*; very plentiful, including several of the female bright blue variety *cervinus*; *L. corydon*; *C. minima*; *Lycena argiades*; *A. comana*; *M. stellatarum*; *S. concolor*; *A. similata*. On several evenings during August I noticed the following in the Prater (the Bois de Boulogne of Vienna): *A. lathonia*; *C. myrmidone*; *Lycena argiades*; *P. c-album*. On September 4th, during a day's stag shooting in the mountains of Lower Austria, *E. athrops* was found in considerable numbers up to a height of about 3000 feet. September 12th, a sunny morning, was spent in some large woods, well known to local collectors, north of the Danube. The woods largely consist of oaks and open occasionally into marshy meadows. The following were seen: *Araschnia prosa*, the dark summer form of *A. hecabe*; *V. io*; *V. urticae*; *P. c-album*; *P. atalanta*; *A. paphia*; *A. lathonia*; *L. argiades* (plentiful); *C. virgaureæ*. On September 19th and 20th, in the same district and in hot weather, many of the same species were found as on the 12th, and in addition *P. nachaon*, *C. chrysothème* and *G. rhamni*, the latter newly emerged. *V. io* was in very large numbers. The following varieties of *L. icarus* were also taken: *arcua*; *anethystina*; *cervica*. The usual colour of the female in Austria is dark brown with practically no blue scales on the upper side. These same woods in July are celebrated hunting-grounds for the Apaturias. *A. iris* can be taken in numbers; a friend of mine last summer had three in his net at one time. The bandless variety *iole* is by no means unknown here. *A. ilia* and its reddish variety *cyprie* are also to be had, and that wonderfully handsome insect *Linantis populi* is comparatively common. The end of September practically ended the butterfly season, and one would have to travel far indeed to find a greater variety of insects, plants and flowers, amid such charming and varied surroundings within half an hour's journey of a large capital city, as in the Vienna neighbourhood. Two insects left a particular impression on one's mind. *A. lathonia* on account of its habit of skimming low along cart tracks at the edge of woods and of settling in the ruts, and *P. c-album* on account of its tameness. The green colour of a net seems to attract it, and I have several times known it to settle on the net. It will persist in flying round and

round the same spot and settling on the same leaf or twig, as one has seen *T. rubi* do in England, and is not easily frightened away.—B. H. COOKE (Lieut.-Colonel); Naval and Military Club, Piccadilly.

NYMPHS OR NAIADS.—Mr. W. J. Lucas, in the January number, p. 5, adopts the term "naiad" for odonate nymphs, following Comstock. Tillyard, in his excellent work on dragon-flies, uses the term "larva." It may be useful to employ a special name, but "naiad" is inadmissible since it has long been in use for the freshwater mussels. Thus, for instance, Isaac Lea in 1836 published a 'Synopsis of the Family of Naiades,' and in 1900 C. T. Simpson published a 'Synopsis of the Naiades, or Pearly Freshwater Mussels.' If a special term is required for the larvæ of Odonata, possibly Odonaiad would be suitable.—T. D. A. COCKERELL.

PLATYMISCHUS DILATATUS, WESTWOOD.—On October 5th, 1920, my wife and I were walking on the beach at Ventnor, Isle of Wight, where quantities of *Fucus* and other seaweeds had been thrown up. Here and there were large boulders, and swarming over them were vast numbers of small wingless Hymenoptera, at first sight appearing to be ants. On collecting a number it was at once evident that they belonged to the Proctotrypoid series, and on looking up the literature they were readily identified as *P. dilatatus*. They undoubtedly came from Dipterous larvæ in the seaweed. The species has been considered rare, and even the British Museum had only a few species. I probably obtained more than had been secured by all collectors previously, or at any rate could easily have done so.—T. D. A. COCKERELL.

LIBELLULA DEPRESSA, LINN. (ODONATA).—It may be of interest to record that I captured, flying slowly and low up a small stream at Tibshelf, Derbyshire, a specimen of *Libellula depressa*, Linn., on August Bank Holiday, 1921. The upper part of the abdomen was covered with slate-coloured bloom, whilst underneath the abdomen was so badly eaten away (possibly by some parasite) that it was useless as a cabinet specimen.—A. W. RICHARDS; 2, Denman Drive, Newsham Park, Liverpool.

HEMEROBIUS STIGMA, STEPH. (NEUROPTERA).—Two examples of this interesting little lacewing were taken at Esher Common, Surrey, on January 30th last. As they passed by on the wing they could be at once recognised by their slow characteristic style of flight, and were easily secured even without the help of a net. Their presence in January is welcome, although they can scarcely be looked upon as harbingers of the spring, for I believe I have taken imagines in every month of the year. It would be interesting to know how many broods there are in a season.—W. J. LUCAS; February 3rd, 1922.

RESTING HABIT OF PIERIS RAPÆ.—In the evening of July 20th, when the declining sun had thrown the southward facing hedgerows into shade, I saw nine *Pieris rapæ* and one *P. napi* at rest amongst a patch of nettles. All the *P. rapæ* had chosen as resting-places nettle leaves which through some cause were bleached to a creamy white colour, remarkably similar to the colour of the butterflies. In one case there were three butterflies on one leaf, and in another case two. This would suggest that the sites had been chosen deliberately.

I think it is a fact that the dead leaves would part with their heat at the sun's declension to a much smaller extent than the living foliage, if so this would probably be the true determining factor, not the question of colour for protective purposes. A. H. THOMPSON; 54, Church Road, Northwich.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, January 18th, 1922* (Annual Meeting).—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—Dr. Neave, one of the Secretaries, read the Report of the Council, which was adopted on the motion of Mr. T. H. Grosvenor, seconded by Mr. S. Edwards. The Treasurer then read his report and balance-sheet, which was adopted on the motion of Mr. A. E. Tonge, seconded by Dr. E. A. Cockayne. The Fellows nominated by the Council as Officers and Council for the ensuing year were declared by the President to be formally appointed. The President then delivered his address, illustrated with lantern-slides, after which a vote of thanks to him was passed with acclamation, on the motion of Mr. G. T. Bethune-Baker. A vote of thanks to the Officers was also passed on the motion of Mr. E. E. Green, seconded by Dr. C. J. Gahan.

Wednesday, February 1st, 1922.—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—The President announced the Vice-Presidents for the ensuing year to be Mr. R. Adkin, Mr. E. C. Bedwell, and Prof. E. B. Poulton, D.Sc., F.R.S., etc.—The Treasurer read a letter from the Hon. N. C. Rothschild announcing the death of Mr. W. Purdey, of Thanet Gardens, Folkestone, and a vote of condolence was passed to his relatives.—The Rev. F. D. Morice also gave a short account of the life of the late Mr. F. W. Sladen.—The following were elected Fellows of the Society: Dr. R. E. McConnell, Arua, Uganda; Dr. H. T. Fernald, Ph.D., Professor of Entomology, Massachusetts Agricultural College, Amhurst, Mass., U.S.A.; and Dr. Alfred Moore, M.D., 31, Alfred Place, South Kensington.—The President, Mr. Sheldon and Mr. Adkin all brought for exhibition some remarkable series of *Cidaria truncata*, *C. citrata* and *C. concinnata*.—Mr. F. D. Morice made a short communication on the life-history of a British sawfly, *Pristiphora pallipes*, Lep.—Mr. H. J. Turner exhibited, on behalf of Mr. Thomas Greer, a series of aberrations of British Lepidoptera from Co. Tyrone.—Mr. Ashby exhibited some butterflies from Piedmont, Italy, and said that he considered the Val di San Bartelemi, close to Nus, to be one of the best collecting grounds in northern Italy.—Mr. J. H. Durrant, on behalf of Dr. Gahan, exhibited some living examples of the Cassid beetle *Aspidomorpha sanctæcrucis* from India; the causes of the brilliant metallic coloration of this beetle were discussed by Mr. Arrow and Mr. Willoughby Ellis, and Dr. Neave commented on the habits of similar African species.—A paper by Mr. Martin E. Mosely was read on "Two New British Species of *Hydroptila*."

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*December 8th, 1921.*—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. H. Worsley-Wood, of Acton, was elected a member.—Mr. R. Adkin exhibited series of *Diaphora mendica* from co. Cork and co.

Tyrone, Ireland, pointing out that the latter differed from the Cork specimens known as var. *rustica* in that they were of a greyer tone of colour and the veins indicated in dark grey: he suggested ab. *venosa* as a suitable name to distinguish the form.—Mr. Staniland, large galls on the roots and branches of crab-apple from N. London formed by the woolly aphis, *Schizoneura lanigera*.—Mr. H. Leeds, the heart of a cauliflower with extensive fasciation and of a green coloration.—Mr. B. Adkin, specimens of *Brenthis selene* and *B. euphrosyne*, and inquired what were the upperside differences if any.—Mr. H. Moore, a short series of *Teracolus puniceus* = *hetera* from Nairobi.—Mr. K. G. Blair, a *Papilio machaon* without the red spot at the anal angle of the hind wing, and a very light form of *Crambus pascuellus* from Tring.—Mr. Blenkarn, the local Coleoptera, *Pentarthrum huttoni*, from Killarney, and *Lissodema cursor* from Rammore Common.—Mr. Dennis, the oak "spangle" gall, *Neuroterus numismatis*, from N. Sussex.—Mr. Bunnett, the var. *doubledayaria* of *Amphudasy betularia* with an intermediate form from S.E. London.—Mr. R. Adkin read a report as the Society's Delegate to the Conference of Corresponding Societies of the British Association.

January 12th, 1922.—Mr. E. J. Bunnett, M.A., Vice-President, in the Chair.—A Member exhibited *Heliopholus hispidus*, the dark form from Torquay, and the lighter form from Dorset, and a very dark aberration of *Ortholitha plumbaria*.—Mr. Withycombe, larvæ of *Teniorhynchus richardi* (Dip.) attached by siphons to roots of *Typha angustifolia* from Epping, with illustrative photographs.—Mr. Hy. J. Turner, for Mr. Thomas Greer, Tyrone, the following aberrations recently taken by him: *Euchloë cardamines*, (1) ♂, ab. *marginata*; (2) ♂, dark streaks on the orange blotches; (3) ♂, very small; (4) ♂, unusually large; (5) ♀, ab. *radiata*; (6) ♀, with orange streaks above and below. *Melitea aurinia*, ♀, dull obscure coloration. *Pararge megera*, (1) ♂, with apical ocellus reduced to a small dot; (2) ♂, with double apical ocellus. *Polyommatus icarus*: (1) gynandromorph R. ♂, L. ♀; (2) ♂, with faint red marginal blotches upper side hind margin hind wings, underside ab. *icarinus*; (3) ♀, with marginal red blotches extended to form a band.—Mr. Goodman, *Cænonympha tiphon*, typical and rare *philoxenus* from Britain, and rare *isis* from the Dauphiné.—HY. J. TURNER, *Hon. Editor of Proceedings*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held on February 1st, 1922, at the Manchester Museum, Mr. H. Britten, F.E.S., in the Chair.—Messrs. G. E. Whitehead, Wychwood, Buxton; E. R. Brown, 237, Brunswick Street, Manchester; C. S. Merriman, 22, Central Road, West Didsbury, were elected members of the Society.—*Exhibits*: Mr. G. Wynne, series of *D. galii* from N. Cornwall, larvæ; *D. tilieæ*, including 1-spot and banded forms from Kent, larvæ; and *M. porcellus* from Macclesfield, larvæ; all bred this year.—Mr. W. P. Stocks bred *E. lanestris* and 2 Noctuæ, near *M. thalassina*.—Mr. Britten for Mr. Wright, series of the new Tineid *Blastobasis lignea* from Grange.—Mr. Britten, *Hylephila obtusa*, *H. sponsa* and *H. sp.*?, species of Diptera which follow Hymenoptera in flight. Ova of Lepidoptera preserved by blowing and mounted on black cards. About 60 species of Diptera new to Lancashire and Cheshire list in addition to those exhibited last month.—Mr. R. Tait then read

a paper on "*Agrotis ashworthi*: Life-History up to date." In addition to the general history of the life of this interesting moth he gave some very interesting personal experiences of collecting and breeding the insect. Mr. Tait illustrated his paper by a drawer containing a fine series of the perfect insect showing marked variation. His remarks and experiences were confirmed and amplified by Messrs. W. Buckley and C. F. Johnson, who both exhibited a fine series of the perfect insect.—J. F. G. WYNNE, *Hon. Recording Secretary*.

OBITUARY.

W. L. DISTANT.

It is with sincere regret that we record the death, on February 4th, of another old and valued contributor to our pages, who had also been a member of our Reference Committee since February, 1890. After a long illness, due to cancer, the end came, at a nursing home at Wanstead, at the age of seventy-seven years.

Born at Rotherhithe on November 12th, 1845, William Lucas Distant was a son of Capt. Alexander Distant, "who, in old South-Sea whaling-days, sailed round and round the world, and transmitted a love of roaming to his sons." On August 5th, 1867 (which he always spoke of as being the most eventful day of his life), our friend himself started on a voyage to the Malay Peninsula, a voyage which bore fruit in 1882-1886 in the publication of his valuable work '*Rhopalocera Malayana: a Description of the Butterflies of the Malay Peninsula*.'

In 1873 he married Edith Blanche de Rubien, and his family consisted of five sons and three daughters.

In June, 1890, he sailed for a "twelve months' business sojourn in the Transvaal," in connection with the farming industry, and an account of his observations and experiences as a student of Nature was published in 1892, under the title of '*A Naturalist in the Transvaal*.'

In 1897 he succeeded J. E. Harting as Editor of '*The Zoologist*,' and resigned the editorship at the end of 1914.

Another visit to the Transvaal was made in 1898, and during 1900-1911 appeared the first volume (which had no successor) of '*Insecta Transvaaliensia: A Contribution to a Knowledge of the Entomology of South Africa*.'

From April, 1899, to November, 1920, he was engaged as a part-time Assistant at the British Museum (Natural History), and during this period of 21½ years he re-arranged the national collection of Rhynchota, and described in a voluminous series of memoirs the wealth of new species which he found there. His private collection of about 50,000 specimens, chiefly Rhynchota, and containing altogether over 2,500 types, came to the Museum in 1911, and the purchase of it by the Trustees was completed nine years later. The large and attractive insects forming the Cicadidæ always remained his favourite group.

A series of family bereavements contributed largely to the break-up of his health. In 1913 his second son was drowned in Australia, his wife died in 1914, and in the following year his youngest son died at Alexandria, while serving with the Mediterranean Expeditionary

Force. Towards the end of 1920 he went for a prolonged visit to Yarmouth, which was always a favourite health-resort of his, but, as his colleagues had only too clearly foreseen, he was destined never to resume his labours in the old fields of activity. He was buried in the family grave at Nunhead Cemetery on February 7th, 1922.

His connection with the Entomological Society of London was a long one, for he was elected a Fellow (then termed a Member) as long ago as 1875. He was a Vice-President in 1881 and again in 1900, and acted as one of the Secretaries from 1878 to 1880, while he served upon the Council from 1900 to 1902. Of other learned societies he was Member of the Anthropological Institute (of which he was Director and Honorary Secretary 1873-1881), Member of the Entomological Society of France, and Corresponding Member of the Entomological Society of Stockholm and of the Buffalo Society of Natural Sciences.

Distant's literary output was considerable, and reference has already been made to his special memoirs and the books on the Transvaal and the Malay Peninsula. Other important publications were: 'Biologia Centrali-Americana,' 'Hemiptera-Heteroptera,' vol. i (1880-1893) and (in part) 'Hemiptera-Homoptera,' vol. i (1881-1905); 'A Monograph of Oriental Cicadidæ' (1889-1892); 'The Fauna of British India,' 'Rhynchota,' vols. i to vii (1902-1918); and 'A Synonymic Catalogue of Homoptera, Part I—Cicadidæ' (1906).

Although he was keenly sensitive to adverse criticism, his conversation was both humorous and entertaining, as he always had a large fund of anecdote and reminiscence to draw upon, and knew how to tell a good story with the greatest effect. At one time he was an enthusiastic fresh-water fisherman, but, when the burden of years began to press heavily upon him, he found a more congenial pursuit in the cultivation of his flower-garden. Angling and gardening incidents never failed as a basis for friendly intercourse, whenever he met with others who shared in his genuine love for such things.

HERBERT CAMPION.

WILLIAM PURDEY.

As announced in the February number of this magazine, the death of William Purdey took place on January 19th last.

He was born at Folkestone on January 22nd, 1844, and was thus within three days of the completion of the seventy-eighth year of his age on the date of his decease.

By occupation he was a locksmith, and for fifty-six years he faithfully served the South-Eastern Railway Company, his particular duty being to keep in repair the locks on the Channel boats.

Purdey was essentially a field lepidopterist, and his special study, at any rate for many years past, has been the lesser British Lepidoptera, including all groups except the *Tineina*.

He was of an exceptionally persevering and energetic nature, with excellent powers of observation, and the necessary sound judgment to enable him to use these qualities to the best advantage. He was unquestionably, if not *the* best, at any rate one of the very best field workers we have ever produced.

His contributions to the literature of the science were comparatively few, and mostly consisted of records of his captures. The

earliest the writer can trace is an announcement that he had bred *Eudemis euphorbiana*; this note appeared in the 'E.M.M.,' vol. v, p. 106 (1868).

He was the discoverer of *Rhyacionia purdeyi*, a Tortrix new to science, which the describer, Mr. J. H. Durrant, named after him, 'E.M.M.,' vol. xlvii, p. 252. He also reinstated *Hellensia carphodactyla* in the British list, 'Ent. Record,' vol. xix, p. 78.

His last note appears to have been on the discovery of the larva of the very local plume, *Oryctilus pilosellae*, for which he had discovered a locality near Folkestone, 'Entomologist,' vol. xliii, p. 89 (1910). He also described the larva of *Lozopera beatricella*, 'Entomologist,' vol. xxxii, p. 306.

Amongst the most notable of his captures were a specimen of *Apiasta enonaria*, one of about half-a-dozen that have ever been found in Britain, and one of *Ditsenia ramburialis*, of which species Barrett states "seven examples have occurred in Britain"; he also records the capture by himself of *Argynnis lathonia* and *Eucanessa antiopa* at Folkestone.

Purdey was famous for his captures of the rare and beautiful forms of *Peronea cristana* occurring at Folkestone, including those of ab. *purdeyana*, named after him by S. Webb. Of this form every specimen known (about a dozen in number), except one, was taken by Purdey.

Of the extremely rare and beautiful ab. *tolana*, Desvignes, he took five examples, and also perhaps the most beautiful specimen in existence, the one Clark took for his type of ab. *charlottana*, which is, however, identical with the form named previously by Desvignes ab. *curtisana*. The most abundant white form, ab. *subcapucina*, Desygs., extremely rare elsewhere than at Folkestone, he captured in scores: the writer possesses thirty of these, and has seen a considerable number in other collections.

Purdey possessed his powers unimpaired almost to the last, and made many captures during the past summer: two years ago he indulged in a day's collecting involving a walk of at least twenty-five miles!

He had an excellent collection of the groups he studied, and the writer well remembers with what surprise he looked through it a few years ago, and saw the long rows of rare species, all of his own capturing. There were very few occurring in the south-east of England that he could not obtain as many examples as he required, when necessary!

During his long life he became associated more or less intimately with practically every lepidopterist who was his contemporary, including Howard Vaughan, P. B. Mason, J. A. Clark, C. A. Briggs, W. P. Weston, Sydney Webb, Battershell Gill, and very many others.

Purdey was something more than a very capable field lepidopterist. In all his actions he was honest, straightforward and honourable; a man whose word was to be trusted, and who thought and spoke of his fellow men with kindness and courtesy.

He had earned the respect and esteem of all who came into contact with him.

W. G. S.

February 15th, 1922.

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[No. 707

EDITORIAL.

FOR a period of over thirty years it has been my much valued privilege to conduct this Journal. Under advice, however, I have now reluctantly decided to withdraw from some of the duties this work entails. To this end Captain Norman D. Riley has very kindly undertaken to act as Editor for me from May next. [R. S.]

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from p. 57.)

Eulype hastata.—I only saw one example; this was at Lochinver and in the possession of Mr. Whittle. It was the form *subhastata*, Nolc, or near it.

Mesoleuca ocellata.—Common.

Perizoma alchemillata.—One example at Inchnadamph.

P. albulata.—Common in meadows.

P. minorata.—Not uncommon on rocks at Lochinver.

P. blandiata.—Abundant; the form is in some instances distinctly more banded than Rannoch specimens.

Camptogramma bilineata.—Abundant; most of the specimens are much darkened; some of them are similar to *ab. hibernica*, Prout, as figured in South's 'Moths of the British Isles.' pl. 61, fig. 5, and some are even darker than that specimen.

Hydriomena furcata.—The larvæ of this species were common at Lochinver on the sallows. I beat out some three dozen, from which I only bred six examples, but these made me wish I had a much longer series. No two of the specimens are alike and they are all good aberrations. One is *ab. infuscata*, Staud.; two are forms near *fusco-undata*, Donovan. The most remarkable example has white ground-colour to the superiors, clouded and mottled with bright chestnut colour, and some black transverse markings.

H. impluviata.—Lochinver, amongst alder; the only example brought home is a light-coloured variegated form.

H. ruberata.—Some half-dozen larvæ turned up amongst sallow tips gathered to rear *Peronea hastiana* from.

Eupithecia pulchellata. Larvæ common on foxgloves at Lochinver. The series bred includes the southern type, race *hebodium*, Sheldon, and intermediates.

E. lariciata and *E. castigata*.—A few examples of each at Lochinver.

E. satyrata,* var. *callunaria*.—Common flying over heather.

E. plumbeolata.—I met with this species fairly commonly at Inchnadamph under remarkable circumstances; it is, of course, well known that the usual, and, so far as my knowledge goes, the only recognised food-plant, is *Melampyrum pratense*; but the moth at Inchnadamph was only found in meadows where *Melampyrum* does not grow. They, too, seemed to have the transverse lines somewhat more pronounced than in southern examples of this species, and one wondered if possibly a hitherto unrecognised British species had been met with in this remote spot. Females were captured and confined over specimens of all the likely plants growing in the meadows, with the result that they deposited eggs on *Rhinanthus crista-galli* and *Euphrasia officinalis*; on the seeds and flowers of these plants, and also on those of the nearly allied *Bartsia odontites*, the larvæ fed up. These larvæ showed a remarkable feature which is not noticeable in the specimens fed upon *Melampyrum pratense*—they had very noticeable black chitinous thoracic and anal plates! I consulted Mr. Prout, who thought they might refer to the nearly allied *E. immundata*, which has these plates, and is found in North-West Europe. The imagines, however, when compared with specimens of *E. immundata* in the National Collection, did not agree with that species, and with the exception that the wings were slightly narrower in relation to their length, did not appear to differ from *E. plumbeolata*. Examples were then handed to Mr. Pierce for examination of the genitalia, but these were found to be indistinguishable from those of *E. plumbeolata*.

This discovery of additional food-plants has thrown light upon a problem that has puzzled me. Some years ago I netted in the centre of Wicken Fen examples of a moth which I could not distinguish from *E. plumbeolata*; and certainly *Melampyrum pratense* does not grow there. Last autumn, however, I did see *Rhinanthus crista-galli* growing freely in the Fen, and have no doubt but that it is the food-plant there also.

E. nanata.*—Common.

E. pumilata.*—Certainly the most abundant *Eupithecia*, being extremely common on the heathery ground. Some of the examples from Inchnadamph were entirely grey in colour.

Abraxas grossulariata.—A few at Lochinver, but abundant on the Island of Soyea.

Cabera pusaria.*—Fairly common.

C. exanthemata.—Lochinver, not common.

Ellopiia proapiaria.—Lochinver.

Metrocampa margaritata. *—Common.

Selenia bilunaria.—Lochinver; larvæ; Mr. Whittle.

Gonodontis bidentata.—Lochinver.

Opisthograptis luteolata.—Lochinver.

Epione apiciaria.—Lochinver; bred from sawfly.

Semiothisa liturata.—Lochinver.

Hybernia marginaria and *Phigalia pedaria*.—Larvæ at Lochinver on birch and sawfly.

Pachys betularia.—Lochinver; at rest on rocks; the light form only.

Boarmia repandata. *—Common at rest on rocks; the specimens were grey, resembling the Hebridean form *ab. sodorensium*, Weir.

Gnophos myrtillata. *—Not uncommon at rest on rocks; a rather dark form.

Ematurga atomaria. *—Common on the moors.

Bupalis piniaria.—Lochinver, abundant; the northern form of course.

Thamnonoma wauaria.—Gardens at Lochinver.

Scodionia fagaria.—Lochinver, rare.

Zygaena filipendulæ.—I could not come across a colony of this species on the mainland, but Mr. Adkin reports that William Salvage found one on the mountain, Suilven, and Mr. Whittle wrote me that he found a *Zyganid* cocoon at Lochinver which was probably one of this species. As I have already stated, there was a numerous colony on the Island of Soyea. The examples of those I have brought home do not differ from southern specimens with the exception that the thorax and abdomen is somewhat more shaggy.

Hepialus humuli.—Lochinver; the examples are strictly typical.

H. sylvinus.—Reported by Mr. Whittle from Lochinver.

H. fusconebulosa (velleda). *—Common at Lochinver, less so at Inchnadamph. A very dark and richly variegated form, quite as much so as the Shetland specimens; var. *gallicus*, Ld., occurred in the proportion of about 1 to 5 of the type form.

*Scoparia ambigua*lis, race *atomalis*. *—Abundant everywhere.

S. murana.—One or two examples on walls at Inchnadamph.

S. frequentella.—Lochinver, at rest on rocks; common.

S. angustea.—Reported by Mr. Whittle at rest on the house at which we stayed at Lochinver.

Nemeophila noctuella.—Very pale specimens were common on Soyea at the end of June.

Pyrausta purpuralis. *—A few examples only of either this species or of *P. ostrinalis*; the specimens are intermediate.

Botys lutealis.—Lochinver; reported by Mr. Whittle.

B. fuscalis. *—Common.

B. forficalis.—In gardens at Lochinver.

Chrysocoris festaliella.—One or two examples at Lochinver.

Stenoptila bipunctidactyla.—Inchnadamph; abundant in a meadow.

Amblyptilia punctidactyla.—Lochinver.

Crambus praelatus.—Abundant.

C. ericellus.—Frequent in its usual haunts, *i. e.* moors on which heather is mixed with grass, and at an altitude of about 500 ft.

C. pascuellus.—Extremely local but not uncommon.

C. culmellus.—Abundant.

C. margaritellus.—Extremely local but not uncommon.

Salebria fusca.—Not common; a very variegated form, similar in this respect to *S. betulae*.

Galleria sociella.—Lochinver.

Tortrix rosana and *T. ribeana*.—Lochinver, bred.

T. viburniana.—Common amongst *Myrica gale*.

Peronea rufana.—Larvæ on *Myrica gale*, mostly the pale straw coloured unicolorous form; one or two examples have traces of longitudinal streaks.

P. mixtana.—The larvæ of this species were extremely abundant at Lochinver, each tuft of *Calluna vulgaris* on the moors having several larvæ in it. The imagines bred varied from unicolorous reddish brown to almost white = *ab. provinciana*, Peyer.

P. hastiana.—This species was as abundant on sallow at Lochinver and on the Island of Soyea as the last was on heather. It was noticeable that only the very small bushes that did not rise above the surrounding heather were frequented. On bushes that attained a greater height than this hardly a larva was to be found. I brought home two large bagsfull from Lochinver and bred out over 1000 examples. Many of them are very remarkable; one or two very beautiful forms I have never seen before. They are developments of *ab. byringerana*, Hüb., having the brown transverse strigæ broken up with white blotches and longitudinal striæ, and somewhat closely resemble *P. cristana*, *ab. capucina*, Johnson. The other forms include *abs. mayrana*, Hüb., *autumnana*, Hüb., *combustana*, Hüb., *aquilana*, Hüb., *subcristana*, Stphs., *byringerana*, Hüb., *divisana*, Hüb., *albistriana*, Haw., *pruinosa*, Stgr., and numerous unnamed forms.

P. ferrugana.—Lochinver, bred from birch.

P. aspersana.—Soyea, bred from sallow tips.

Rhacodia caudana.—Lochinver; reported by Mr. Whittle.

Penthina soroculana.—Lochinver, common amongst birch.

P. dimidiana.—Abundant amongst *Myrica gale*, both in larva and imago stages.

P. marginana.—A few examples.

P. tripunctana.—Lochinver.

Sericoris littoralis.—A very bright silvery form with strong

fuscous transverse strigæ was common on the rocks on Soyea; we could not find it on the mainland, although thrift was a common plant along the seashore.

S. cespitana.—A fine bright ochreous form of this species was abundant on Soyea, and so far as our observations went it was peculiar to it, for we could not find it on the mainland.

S. lacunana.*—A very small form.

Mixodia schulziana.*—Occurring sparingly at all levels that I visited, i. e. up to 2000 ft.

Euchromia arbutella.—Not uncommon amongst its food-plant *Arctostaphylos uva ursi*.—At Lochinver.

Orthotaenia ericetana.*—Common at dusk flying in meadows.

Cnephasia musculana.*—Common, extremely bright forms.

C. penziana.—This much-wanted and beautiful species produced a mild sensation. On July 16th Mr. Whittle reported that he had disturbed on a rock, but missed, a very handsome moth, which from the momentary glance he had of it appeared to be a "Nola," but if it was a species of that group then it was new to Britain! The next day I, too, disturbed a moth from a rock, fortunately capturing it. Obviously it was *C. penziana*, and on showing it to my friend he at once pronounced it to be his lost prize. On the same evening I took another example, also from a rock, but although we both searched rocks and walls for hours each day for over a week, until after my departure further examples were not met with. Mr. Whittle, however, after that date discovered one on the garden wall of the house in which we stayed.

Bactra lanceolana.*—Very abundant in all swamps up to 1500 ft.; the high-level forms were extremely small.

Ancylis unguicella.*—A few examples only.

A. biarcuana.*—Not uncommon amongst sallow.

A. myrtilana.—One example at Inchnadamph.

A. lundana.—Lochinver; not common.

Grapholitha ramella.—Reported by Mr. Whittle from Lochinver.

G. subocellana.*—Abundant.

G. penkleriana.—Reported by Mr. Whittle from Lochinver.

G. tetraquetrana.*—Abundant.

Steganoptycha augustana.—Extremely brightly marked specimens were bred commonly in July from larvæ obtained in sallow shoots from Soyea; one or two examples were taken on the mainland.

Paedisca semifuscana.*—Larvæ common on *Myrica gale* in July; the examples bred were grey and brown forms only.

P. solandriana.—Reported by Mr. Whittle from Lochinver.

Halonota similana.—Lochinver, bred from birch.

H. pflugiana.—Lochinver, fine large examples.

H. trigeminana.—Lochinver.

Semasia rufillana.—Lochinver.

Coccyx nemorivaga.—Not uncommon amongst *Arctostaphylos* at Lochinver.

C. taedella.—Swarming amongst spruce at Lochinver.

C. distinctana.—This, one of our most local Tortrices, is apparently an introduced species to Britain, as it feeds exclusively on silver fir, *Pinus picea*, and on other non-indigenous conifers. It was therefore very surprising to find it at such an out-of-the-way spot as Lochinver. On the left bank of the river Inver, some quarter of a mile from its mouth, a dozen or more silver spruce trees had been planted forty or fifty years ago, and around these the species was fairly common at the end of June. The moths were knocked out of the lower branches, and were not seen to fly naturally.

Retinia pinivorana.—Lochinver, common amongst Scotch fir.

Stigmonota compositella.—Inchnadamph, in meadows.

Dicrorampha herbosana.—Lochinver, not uncommon in meadows.

Catoptria cana, and *C. scopoliana*.—Common.

Eupocilia angustana.—Common; fine large dark specimens.

E. ciliella.—Lochinver.

Argyrolepis baumanniana.—Lochinver, very local; a small bright form.

A. straminea.—Common in meadows.

A. pratana.—Lochinver.

A. hamana.—Lochinver.

I am indebted for the following list to Mr. Whittle, all taken at Lochinver by him.

LIST OF THE TINEINA, IN THE ORDER IN WHICH THE VARIOUS SPECIES OCCURRED, NOTED DURING OUR STAY AT LOCHINVER, JUNE 18TH TO AUGUST 27TH, 1921.

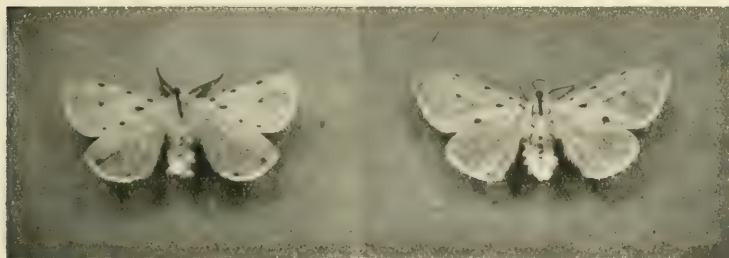
<i>Simaethis fabriciana</i> (common).	<i>Gelechia ericetella</i> .
<i>Lampronia praelatella</i> (common).	<i>Plutella maculipennis</i> .
<i>Lithocolletis ulmifoliella</i> .	<i>Elachista rhynchosporaella</i> .
<i>Argyresthia conjugella</i> (common).	<i>Gracilaria springella</i> .
<i>Coleophora albicosta</i> (common).	<i>Endrosis lactella</i> .
<i>Scardia cloacella</i> .	<i>Gelechia terrella</i> .
<i>Elachista apicipunctella</i> .	<i>Coleophora laripennella</i> .
<i>Swammerdamia heroldella</i> .	<i>Aristotelia tenebrella</i> .
<i>Ornix betulae</i> .	<i>Opostega salaciella</i> .
<i>Gracilaria tringipennella</i> .	<i>Argyresthia pygmaeella</i> .
<i>Glyphipteryx thrasonella</i> and var. <i>cladiella</i> .	<i>Diplodoma herminata</i> .
<i>Argyresthia brockeella</i> .	<i>Argyresthia goedartella</i> .
<i>Pleurota bicostella</i> .	<i>Tineola biselliella</i> .
<i>Gracilaria elongella</i> .	<i>Depressaria liturella</i> .
<i>Coleophora caespititiella</i> .	<i>D. applana</i> .
<i>Phylloporia bistrigella</i> .	<i>Chelaria huebnerella</i> .
<i>Elachista kilmunella</i> .	<i>Tinea pellionella</i> .
	<i>Gracilaria stigmatella</i> .

DIAPHORA MENDICA, FORM *VENOSA*, N.F.

BY ROBERT ADKIN, F.E.S.

Male, white-grey with a faint brownish tinge, veins darker grey, fringes paler. Female white-grey, veins darker grey, fringes white.

The form above described somewhat approaches *rustica*, and, as in that form, individuals vary somewhat in depth of colour, but differ from *rustica* in the general tone of colour inclining towards grey instead of ochreous shades. In the lightest males it is very pale grey with the slightest tendency towards a brownish tinge, while in the darkest the grey takes a somewhat more brownish tone, whereas in *rustica* there is always a suspicion of an ochreous tone even in the palest specimens, the darkest being a decided, although it may be pale, ochreous



brown. Moreover, the dark grey veining, especially in the more strongly marked specimens of both sexes, is a character that at once separates *venosa* from other forms of the species. This form is also less densely scaled than *rustica*, which gives it a semi-transparent appearance which is more particularly noticeable in the female. Both sexes have the black spotting common to the species more or less well-defined and agreeing as to the number of spots.

The race occurs in the lowlands of County Tyrone, Ireland, and a few specimens, reared from a captured female, bred true to form.

Types, male and female, in the collection of the British Museum (Natural History), and co-types in that of the Tring Museum and my own.

Eastbourne;
February, 1922.

FURTHER NOTES ON THE ODONATA OF CONSTANTINOPLE AND ADJACENT PARTS OF ASIA MINOR.

By KENNETH J. MORTON, F.E.S.

SINCE the appearance of my "Notes on the Odonata of Constantinople" ('Entomologist,' 1915, pp. 129-134), Major Graves has kindly sent me two additional lots of dragon-flies collected by him in and around Constantinople, and at Kury Yalova and Brusa, in Asia Minor. These include some species which are not mentioned in my former list, and as the existing information regarding the dragon-flies of the region is none too full, it may be well to publish these further records. Another reason for doing so is to call attention to the examples of *Lestes viridis*, which in some respects differ from the ordinary form of this species as it is known to me from Central and South-Western Europe and Algeria. The following species were not included in the collections previously received from Major Graves: *Lestes virens*, *Cercion lindeni*, *Pyrrhosoma nymphula*, *Aeschna mixta*, *Somatochlora flavomaculata*, *Sympetrum fonscolombei*, *S. meridionale* and *Orthetrum anceps*.

CALOPTERYGIDÆ.

Calopteryx virgo festiva, Brullé.—Belgrade Forest, ♀, i. vi. 19.

AGRIONIDÆ—LESTINÆ.

Lestes viridis, Vanderl.—Gyök-su, ♂, 6. viii; ♀, 13. viii. 20; Brusa, 2 ♂♂, 1 ♀, 19-21. ix. 20; Kestel, 10 m. S.E. of Brusa, ♂, 20. ix. 20.

Somewhat smaller and less robust than specimens in my collection from Switzerland, South of France, Sicily and Algeria, and there seems to be a constant and quite noticeable difference in the form of the superior appendages in their dorsal aspect. To follow the diagnosis of de Selys ('Revue des Odonates,' p. 148), these appendages in *Lestes viridis* show interiorly a basal tooth and what he terms a "tubercle" before the extremity (the expansion seems, however, to be too gradual for this term to be strictly appropriate). In his more extended description he says the inner margin is, as it were, divided into three lobes, of which the first is terminated near the base by an obtuse tooth, and the second by a tubercle before the extremity. In the eastern examples now under consideration this tripartite division is little evident, the distal tubercle being apparently represented by a weak tooth which scarcely projects beyond the inner margin of the appendage. There is a certain amount of individual variation in the appendages of both forms, probably in part due to unequal

shrinkage in drying, but in the main the distinction pointed out holds good. On the distal side of the tubercle in the larger form there are some short spines, variable in number, which I do not trace in the eastern examples. Post-nodals in the latter: Fore-wing, ♂ 9-11, ♀ 10; hind wing, ♂ 8-11, ♀ 9-11 (Selys gives 11-13 for *L. viridis*). Length of hind wing: ♂ 22-24 mm., ♀ 23-25.5 mm. (*L. viridis* from Zürich, ♂ 25-26 mm., ♀ 27-28 mm.).

Mr. Herbert Champion has been good enough to examine the material of *Lestes viridis* in the British Museum, and he reports that males from Belgium, Germany and Sicily agree with one another in having the distal tubercle well developed in the superior appendages, while in one from Cyprus it is barely, if at all, discernible, three males from Ostia, Italy, resembling the

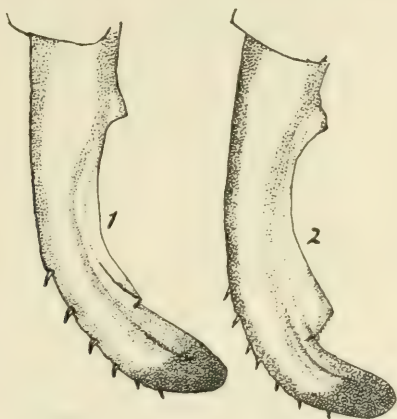


Fig. 1.—Dorsal view of left superior appendage of *Lestes viridis*, ♂, from Brusa; fig. 2, of ♂ from Zurich.

last-mentioned. I had been disposed to consider Major Graves's specimens as an eastern race or sub-species, but the Ostia examples are a disturbing factor, and I leave the matter as it is until more abundant material is forthcoming, especially from Italy and the Balkan countries.

Lestes viridis is an interesting species on account of the circumstances connected with the hatching of the larvæ from the eggs, which are laid in the branches or twigs of willows and *Rhamnus* overhanging the water, and which give rise to what have been called "galls." Ris, in his "Übersicht der mittel-europäischen Lestes-Larven" ('Festschrift für Zschoke,' Basel, 1920), gives characters for the determination of the larvæ of all the European species of *Lestinae* except *L. macrostigma*.

L. barbarus, Fabr.—Kuchük Chekmejé Lake, ♂, 31 . viii . 19.

L. virens, Charp.—Kury Yalova, ♂ ♀, 21-23 . viii . 19.

Platynemis pennipes, Pallas.—Gyök-su, 4 ♂ ♂, 1 ♀, 13 . viii . 20; Sweet Waters of Europe, ♀ (*lactea*), 14 . v . 20.

Cercion lindeni, Selys.—Kuchük Chekmejë L., ♂, 29 . vii . 20.

Pyrrhosoma nymphula, Sulz.—Kartal, ♀, 18 . iv . 20.

ÆSCHNIDÆ—GOMPHINÆ.

Onychogomphus forcipatus, Linne.—Kiat-hané (European side), 2 ♀ ♀, 10–16 . viii . 19; Yalova, ♂, end viii . 19.

ÆSCHNINÆ.

Æschna mixta, Latr.—Pera, ♀, 15 . viii . 19; Kuchük Chekmejë, ♀, 23 . vii . 20.

LIBELLULIDÆ—CORDULINÆ.

Somatoclora flavomaculata, Vanderl.—Kadikeni (Asiatic side), ♀, 8 . vi . 20; Haiki Island, Prince's Islands, 2 ♀ ♀, 10 . vi . 20 ("pine woods, common").

S. metallica, Vanderl.—Belgrade Forest, ♂, 24 . vi . 19.

LIBELLULINÆ.

Orthetrum anceps, Schneider.—Belgrade Forest, ♂, 20 . vii . 19.

O. cancellatum, Linne.—Kuchük Chekmejë L., ♀, 29 . vii . 20.

Sympetrum meridionale, Selys.—Kuchuk Chekmejë, ♂, 31 . viii . 19; Yalova, ♀ end viii . 19.

S. fonscolombi, Selys.—Kuchuk Chekmejë L., ♂, 29 . vii . 20.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 60.)

1. PROCTOTRYPES BREVIMANUS, Kieff.

Serphus brevimanus, André, l.c., p. 323, ♂ ♀.

Hitherto this species was only known in a single pair, captured at Govilon on the Usk, near Abergavenny, and at Niton, in the Isle of Wight, by the late Rev. T. A. Marshall. The female occurred to me at Killarney, in South-west Ireland, in June, 1913; and it occurred on the windows of Monks Soham House on September 1st, 1916, and July 10th, 1918. Sich has found it during October, 1907, on the stem of a mushroom at Kew, in Surrey.

2. PROCTOTRYPES LARICIS, Hal.

Proctotrupes laricis, Hal., l.c., p. 14, ♂ ♀. *Serphus laricis*, André, l.c., p. 322, ♂ ♀.

France. Not very common in English woods (Walker); once taken abundantly during September in Ireland (Haliday); two at Burgess Hill in Sussex on May 3rd, 1911 (Lyle); Scotland in September (Cameron). Very rare in my experience. I have swept it from long grass near Coniferæ, at Bourne Bridge, in Ipswich, during May, and near Killarney, in Ireland, during early June. It once occurred among half a dozen *P. fuscipes* during May on lime leaves in my Monks Soham garden.

3. PROCTOTRYPES LONGITARSIS, Thoms.

Proctotrupes longitarsis, Thoms., Öfv. Sv. Ak. Forh., xiv, 1857, p. 415; Vollenhoven, Pinacographia, iv, p. 30, pl. xviii, fig. 8, ♀. *Serphus longitarsis*, André, l.c., p. 340, ♂ ♀.

Algeria, south coast of France, Lapland. Not hitherto recorded from Britain. I possess a female, correctly named by both Marshall and Chitty, which was captured by Alfred Beaumont on October 13th, 1894, at Boxhill, in Surrey. Chitty himself took one at Dodington, in Kent, on October 2nd, 1903, and I have found it singly at Tuddenham Fen in early June, and on Southwold beach during late and mid-September, in Suffolk.

4. PROCTOTRYPES ACULEATOR, Hal.

Proctotrupes aculeator, Hal., l.c., p. 14, ♂ ♀: Blanch. Cuvier, Regne Anim., 1849, pl. cxv, fig. 4; Voll., l.c., iv, 1876, p. 30, pl. xix, fig. 3, ♀. *Serphus aculeator*, André, l.c., p. 219, ♂ ♀.

France and Finmark. "A parasite of *Mycetophila nigra*," Mg. (Voll., who figures the female with entirely rosy and deeply notaulate mesothorax!). Not infrequent in woods (Haliday and Walker); Niton, in Isle of Wight (Marshall). Not very common with us. It doubtless hibernates, for my dates range from November 4th, 1897, when I swept it in a marsh at Bramford, in Suffolk, through mid-April, when it was beaten from *Pinus sylvestris* at Bentley, near Ipswich, to May 3rd and 4th, 1907, when Chitty and I found several on spruce fir at Elveden; Southwold, on salt-marsh rushes in mid-September, on the Suffolk coast; Felden, in Herts (Albert Piffard); Attenborough, Gedling, Mapperley Plains and Teversall, in Notts, during May (Notts Museum); Coventry on July 10th, 1920 (Saunt); several at Bubwith, near Selby, in Yorks (Dr. Fordham); Ballater on August 8th, 1910, in Scotland (Elliott).

(To be continued.)

NEUROPTERA IN DORSET.

By F. H. HAINES, M.R.C.S., L.R.C.P.

DURING the last few seasons the following species of Neuroptera have been met with by me in the Wareham district. The list is not rich, but it may have some interest: *Sialis lutaria*, Linn., abundant on all rivers and suitable ponds, chiefly in May, but also much earlier and later. I have never detected *S. fuliginosa*, Pict., here: Dale calls it abundant at Glanvilles Wootton. *Raphidia maculicollis*, Steph., at Morden, Moreton and Upper Bockhampton in June. Dale records *R. xanthostigma*, Schum., from Glanvilles Wootton, and *R. notata*, Fab., from Middlemarsh.

I may mention, incidentally, that several years ago, the rare *R. cognata*, Ramb., used to be quite common in a copse near the river Eden, at Hever, in Kent, frequenting brushwood in June. It was so active as to be difficult to catch without a net.] *Osmylus chrysops*, Linn., is very uncommon; *Sisyra fuscata*, Fab., common near East Stoke mill and Morden lake from May to July; *Heмерobius micans*, Oliv., East Stoke in July, Morden in September; *H. nitidulus*, Fab., Moreton in May; *H. humuli*, Linn., very common and wide-spread throughout the year; *H. lutescens*, Fab., Morden, Bloxworth and Coombe Wood in May and June; *H. marginatus*, Steph., at East Stoke in July; *H. subnebulosus*, Steph., at Winfrith in gardens, West Lulworth, etc., from May to September; *H. stigma*, Steph., East Lulworth, Morden, Moreton, etc., from May to September; *H. concinnus*, Steph., one specimen in West Knighton Wood, June 13th, 1919, *H. quadrifasciatus*, Reuter (?), one specimen at Bloxworth, June 11th, 1919. *Micromus paganus*, Linn., Coombe Wood, Wood Street, Winfrith gardens and Upper Bockhampton, May to July.

Dale has recorded from Glanvilles Wootton *S. dalii*, McLach., *H. nervosus*, Fab., *H. atrifrons*, McLach., *H. pini*, Steph., *H. pellucidus*, Walk., *Micromus variegatus*, Fab., and *M. angulatus*, Steph.

I have taken *Chrysopa vittata*, Wesm., in the Wood Street woods in June; *C. flava*, Scop., at East Chaldon in June; *C. alba*, Linn., at Coombe Wood, Upper Bockhampton, Yellowham Wood, and West Knighton Wood from June to August; *C. flavifrons*, Brauer, at Tadnoll and Moreton in July; *C. tenella*, Sch. (?), in the Wood Street Woods in June; *C. vulgaris*, Sch., is distributed very commonly in the area during the whole year; the condition, *carnea*, is very frequent throughout the winter, specimens often coming to light. *C. prasina*, Ramb., Morden, East Stoke and West Knighton woods in June and July; *C. ventralis*, Curt., Morden, Holme, Upper Bockhampton and Yellowham Wood in June and July; *C. abbreviata*, Curt.,

Bloxworth in June; *C. phyllochroma*, Wesm., Winfrith gardens in June; *C. perla*, Linn., is one of our most abundant species, occurring very freely in all bushy places through the summer, especially in May, June and July.

Dale has recorded from Glanvilles Wootton *Nothochrysa capitata*, Fab., *Coniopteryx psociformis*, Curt., and (?) *C. lactea*, Wesm.

Panorpa communis, Linn., is very common in all woodland places through the summer, notably from June to August; *P. germanica*, Linn., is extremely abundant in brushwood the whole summer, particularly from May to August; it is very variable.

Brookside,
Winfrith,
Dorset.

RUSSIAN ODONATA AND NEUROPTERA.

BY W. J. LUCAS, B.A., F.E.S.

Just before the outbreak of war Mr. W. G. Sheldon was kind enough to give me a few insects, which he took at Sarepta on the Volga in South-eastern Russia during May and June 1914. Although that date, after all that has since happened, seems almost prehistoric, yet as the fauna of the district is not too well known, even thus late it will not be unsuitable to publish the list. As out of fourteen insects in the little collection there are no less than eleven different species, it may be inferred that Mr. Sheldon purposely selected the specimens he brought away. One or two are somewhat damaged, some are very teneral, and some again are represented by females alone. It is strange that only four species of the dragonflies (indicated by an asterisk) are not British—*Orthetrum albistylum*, *O. brunneum*, *Lestes barbara*, and *Sympycna fusca*. There are no British antlions.

Odonata.

Libellula quadrimaculata, Linn. 1 June. A large female, strongly marked especially at the nodes, and, in this respect, somewhat like many Southern England examples.

**Orthetrum albistylum*, Selys. 12 June. A female quite mature.

**Orthetrum brunneum*, Fonsc. 12 June. A teneral female.

Sympetrum flaveolum, Linn. 4 June. A very teneral female of good size, with wings rather broad and much suffused with a saffron tint.

**Lestes barbara*, Fabr. 26 May. Two teneral females.

**Sympycna fusca*, Vanderl. 26 May. A male.

Ischnura pumilio, Charp. 8 June. A male and a female taken in copula.

Agrion pulchellum, Vanderl. 27 May, a male; 21 May, a female.

Erythromma nias, Hansem. 5 June. A male.

Enallagma cyathigerum, Charp. 8 June. A male.

Neuroptera.

**Formicaleo tetragrammicus*, Fabr. An antlion taken on 30 May.

[Mr. A. H. Jones, who accompanied Mr. Sheldon, gave me another antlion, taken at Sarepta in June—**Myrmecaelurus trigrammus*, Pall.]

Kingston-on-Thames:

March, 1922.

NOTES AND OBSERVATIONS.

SOME LEPIDOPTEROUS NOTES FOR SOUTH DORSET OF UNUSUAL HABITS, ERRATIC DATES, AND OCCURRENCES FOR 1921. — My observations for 1921 have been similar to many others, since the summer was so exceedingly hot that one expected abnormalities in all directions: yet contrary to these expectations some of the unusual habits which I have to record would have synchronised better with a cold one. For instance, the laying-over habit of pupæ I found was very prevalent last summer, much more so than usual, although one would have expected the reverse, and I found that several species which are regularly double-brooded failed to do so, and are still in the pupa. As regards Rhopalocera, I have only two to report on—*Cyaniris argiolus* and *Chrysophanus phlaeas*. Of the first I had a large quantity from ova deposited by May females on holly; they had all pupated by June 25th, and 50 per cent. emerged between July 10th and 16th; the rest I expected to emerge in September, but I have them still and no doubt they will emerge as spring brood, after passing through the whole of the hot summer of 1921. I took several female *phlaeas* in September last, obtained ova to get pupæ for spring brood 1922, the larvæ emerged and I fed them upon sorrel; I noticed they didn't seem to feed as fast as some of the earlier broods I had reared, and when they got to November (hardly a quarter grown) it was manifest that they didn't intend pupating as they should do, but going to hibernate instead. I have eight still living (February 14th) in a cool outhouse and I feed them twice weekly, but I have had several die lately and am enclosing one that died two days ago as an authentic record. They will remain under a particular leaf for a week or nine days, then move out and eat small holes in the leaves for a day or so. As late as January 10th I found two larvæ of similar size to my own under some sorrel leaves I brought home to feed mine on. I think this seems to prove that it has the dual habit of sometimes passing the winter in the pupa, or if the ova are deposited by late females the young larvæ hibernate. I should be glad to know if anyone else has had this experience of *phlaeas*. Taking Heterocera

for the year 1921, I have a quantity of pupæ of the following laying-over that should have emerged as a second brood last summer (in the regular way) and some partially emerged, the rest going over, which seems more curious still, and in one instance (that of *Venilia maculata*) going through a second winter this time. *G. rhizolitha* all emerged August 10th to August 18th—very early date. *Xanthorhœ sociata*: 20 per cent. of summer brood emerged, the rest going to emerge next spring. *Mesoleuca ocellata*: I have forty fine larvæ which spun up in thin webs on the side of the pot last August; the larvæ have been in a half-circle inside ever since, half changed to pupæ, and the first three did so last week (February 8th, 1922). The others now look as though they are going to change also. *Xanthorhœ montanata*: Have been feeding sixty odd larvæ all last summer; only three pupated. One emerged October 10th, 1921, and was in pupa only fourteen days; another emerged December 4th—only nine days, an astoundingly short period; the third died, and the balance of the larvæ are hibernating at all sizes from fully grown downwards (foodplant, bedstraw). *Venilia maculata*: Took females Bere Wood, Bloxworth, May 29th, 1920, reared on wood sage. Not more than 10 per cent. emerged May, 1921 (last summer), and the balance, about twenty-five pupæ, are passing through this winter, 1922. I will record later what happens to them. *Lobophora viretata*: Beat fifteen larvæ from holly, June 17th, 1921; four emerged August 3rd to 10th, rest of the pupæ laying over. I picked up three larvæ of *Bombyx quercus* July 18th and 30th and August 21st. They all pupated early September, 1920; I presume they were var. *callunæ*. However, one died during the first winter; the other two I expected to emerge May or June, 1921, according to *callunæ* habit, but they didn't arrive, neither did they arrive in August, and on October 1st I broke open the cocoons to see if the pupæ were dead, as I anticipated they must be, but they were both alive and healthy, and remained so until January 10th, 1922, when the first died, and on the 15th the second one died. Had I not broken the cocoons open there is no doubt but they would have lived right through this winter, which goes to prove that *quercus*, or *callunæ*, sometimes passes two winters in the pupa. I beat four larvæ of *Gymnoscelis pumilata* from holly, June 17th, 1921. They emerged very small, and a dove grey coloration all over (most unusual food-plant). *Acidalia dimidiata* double-brooded last August: not usual to double-brood here, generally further north. *Asthenes candida* and *Lobophora sexalisata* both failed to double-brood last summer, although they both usually do here, and the pupæ are passing through the winter. I had two fine specimens (one male, one female) of *formiciformis* emerge September 1st and 3rd, 1921, from sticks of willow I had cut the previous April and May (a very late date for emergence). *Erratic dates*: The most unusual for 1921, and one 1920, of wild captures were the following: *gamma*, December 24th, 1920, just emerged, quite fresh, flying over heather. January 28th, 1921: *hippocastanaria* in plenty, also *pumilata*. February 10th: *lithoriza* on a fence (when with Mr. Newman of Bexley). February 12th: Several *multistrigata*. March 12th: dozens of *hippocastanaria*. May 15th: *hippocastanaria* (very late) showing a long range of emergence from January 28th

above: the same date I took eight or nine freshly emerged *porphyrea* which were some months before their time. *Noteworthy occurrences* which I have taken during the year 1921 for this district are as follows: *exigua*, *vitellina*, *præcox*, *formiciformis*, *straminata*, *complanata*, *herapterata*, *subsericeata*, *unca*, *costiestrigalis*, *emutaria*, *senex*, *cribrum*, *renosata* and *interjectaria*.—ALFRED V. HEDGES; Sandbanks, Parkstone, Dorset.

COLIAS EDUSA AND C. ELECTRA: PROPORTION OF PALE FORMS.—Referring to Mr. Westropp's notes in the February issue of the 'Entomologist,' and his theory that the ratio of pale to normal females may be higher in warmer climates, I may say that during four years' residence (from 1913) in the Cape Peninsula, S. Africa, I found the proportion of pale forms of *C. electra* little, if any, higher than in the case of *helice* in England: I should estimate the proportion at rather less than 5 per cent. of the total seen. Natal is, of course, considerably hotter than the Cape. At Knysna, where I made a short stay, about one-quarter way from the Cape to Natal, a higher ratio of pale *electra* forms certainly seemed to prevail, but the total numbers seen were hardly sufficient to make a definite pronouncement. At Malta the relative numbers of *helice*, as compared with normal *edusa*, appear to me about the same as in England: of several scores of *edusa* seen at Tunis and vicinity during a holiday last year, I secured only one *helice* and saw no more. As far as my limited experience in the Mediterranean goes, *helice* forms do not seem to preponderate in hotter climates any more than at home. It would be interesting to know whether the two closely-allied species, *C. electra* and *edusa*, exist side by side in any country, such as Abyssinia, which appears to be roughly the limit of their respective zones.—H. F. HUNT; 5, Dockyard Terrace, Malta, February 10th, 1922.

PLUSIA MONETA IN LANCASHIRE.—Dr. Lowther does not say on p. 63 (*antea*) which of the six localities he mentions produced *P. moneta*, but I assume it was Grange. In any case this is not a "farthest north" record, for that species has been recorded from Hart, which is in Durham (see vol. lii). I am awaiting with interest any records of this species beyond that.—C. NICHOLSON, F.E.S.; 35, The Avenue, Hale End, E. 4.

EARLY APPEARANCE OF VANESSA URTICÆ.—On March 12th, 1922, I saw a specimen of *Vanessa urticæ* in a sunny spot in a meadow here. The insect was evidently newly emerged and in good condition. The earliest specimen that I saw last year was in a local garden on March 24th. —L. H. BOND; Welby Gardens, Grantham, March 15th, 1922.

ARGYNNIS LATHONIA AT GRAVESEND.—I should like to record my capture on September 4th, 1921, of a specimen of *Argynnis lathonia* in the neighbourhood of Gravesend. It is in fair condition, though obviously not fresh—probably an immigrant I suppose.—DOUGLAS WATSON; Stuart House, Overcliffe, Gravesend.

PYRAMEIS ATALANTA: IMMIGRANTS OR HIBERNATED SPECIMENS?—On Saturday, February 25th, a warm and sunny day, I saw three

specimens of *Pyrameis atalanta*, in quite good condition, in the glades of the New Forest near Lyndhurst Road. Two specimens of *Gonepteryx rhamni*, both males, were also seen, and it certainly looks as if the same weather conditions had brought both species out of hibernation together.—WM. FASSNIDGE, M.A., 47, Tennyson Road, Southampton.

ATTRACTIVENESS OF ELECTRIC LIGHT FOR • MOTHS.—In the 'Entomologist' for March, p. 64, the Rev. J. E. Tarbat introduces a subject of much interest, and one which for some years I had intended to write about. Up to about ten years ago the electric lights of Bedford were very attractive to moths, and my friend Mr. W. B. Brocklehurst, who worked them very assiduously, captured an immense number of insects, including *Notodonta tritophus* and *D. templi*. The lamps at that time were open-type arc lamps. A change was then made to gas-filled lamps and with their advent the moths disappeared. It is quite a rare event to see a moth on a lamp at the present time. The Borough Electrical Engineer, Mr. R. W. L. Phillips, informs me that these latter consist merely of an incandescent filament in an atmosphere of argon or sometimes nitrogen. The best arc lamp in the town was fixed on the east side of a wall of the light-generating station and its rays would not be visible for more than 200 yards as houses spread around it in every direction for half a mile to a mile. Our experience was that a very large proportion of the moths taken at the lamps were males, and that many of those taken must have travelled one or two miles. A good example was *B. piniaria*, which is not found within two miles. It is evident therefore that the moths were not solely attracted by light rays. It would appear therefore that moths are attracted to electric lamps by some other means than by light waves, and the change of lamps may assist in determining the nature of this attractive force. Some years ago an article appeared in a daily paper by Mr. Hubert Stringer entitled, "Moths and 'Wireless.' Do moths use wireless telegraphy?" He noted that the males of many moths are attracted great distances by females, much further than could be accounted for by scent, and that males will approach females down wind. They therefore have some means of communication unknown to us. He remarked on the highly-developed antennæ of the males, which would serve as receiving aërials, and that these differ from the female antennæ, which would be the transmitting aërials. He suggested that tests could be made by placing the female in a box of metal or wire gauze, which would cut off any wireless waves. If the male did not come to that box it would support the wireless theory. He states that definite proof could be obtained by making the female's signals audible. In what way, then, does the change of lamps affect this theory? My friend the electrical engineer informs me that a modern argon gas-filled lamp does not propagate any æthereal waves other than light or heat. The arc light, however, can be made to set up oscillatory impulses and most of the powerful wireless stations employ "arc transmitters." In a street arc lamp oscillations of moderate rapidity may be constantly emitted due to the continually varying electrical state of the vapour between the carbons. Mr. Stringer, in the article

previously referred to, says "the final coup would be to imitate the female moth's wireless 'cry' with such accuracy, by means of the artificial circuit, that the males would be deceived into approaching the latter in the belief that a hidden female was calling." It appears we have a very near approach to this in the "arc" lamp. I believe the vibrations of the female are caused by rapid movements of their wings and not by their antennæ.—W. GIFFORD NASH; Clavering House, Bedford.

ATTRACTIVENESS OF ELECTRIC LIGHT FOR MOTHS.—I think your correspondent, the Rev. J. E. Tarbat, is correct when he opines (p. 64) that only certain of the rays of light are the cause of its attractive power for moths. My own experience has been that *all* artificial lights are not attractive, or, at any rate, equally attractive. In the days of the old "ordinary" burners our street gas-lamps here, especially on the outskirts of the town, well repaid the working; but the substitution of the "incandescent mantle" was, entomologically speaking, a retrograde step. Nowadays, for we have not yet attained to the dignity of electric street-lighting, the lamps, though brighter, are not profitable. I do not mean to convey that *no* moths are attracted, but comparatively very few. Neither does a "big blaze" appear to be essential, for experiences at Windermere some years ago proved again that the quality of the light was far more important than the quantity, though one would imagine that an abundance of light, provided it be of the proper kind, would be advantageous. In those days the Windermere electric lights were of a curious old-fashioned pattern, emitting only a dull reddish glow, sadly insufficient for a street illumination, but wonderfully attractive to the moths! A friend of mine worked them assiduously for several seasons and turned up several species considered to be locally rare, viz. *Notodonta trepida*, *N. chaonia*, *Demas coryli*, *Eurymene dolabraria*, the first three in fair numbers; other desirable moths, *Pachys strataria*, a large dark race of *Anticlea nigrofasciaria*, and *Taeniocampa munda*, were plentiful, whilst the commoner moths, such as *Spilosoma menthastri* and *Gonodontis bidentata* (with one var. *nigra*), came in swarms. The acetylene gas-flame I used myself to find very attractive, and Dr. Lowther has worked the petrol vapour lamps with great success in the district around Grange (*vide* his interesting note in last month's issue). Visiting me recently, my friend, the Rev. A. Miles Moss (British Chaplain at Pará, Brazil), told wonderful tales of the attractive power of the city arc-lamps there, and especially of the success of his private arc-light installation right on the border of the virgin forest. His opinion was "the *bluer* the light, the better!" His accounts of the numerous Sphingid, Arctiid and Notodont visitors on a favourable night made me long for the health and the leisure to join him there—to sample the sport and to share the spoil.—FRANK LITTLEWOOD: 22, Highgate, Kendal, March 3rd, 1922.

NON-ATTRACTIVENESS OF ELECTRIC LIGHT.—Is it not more likely that the "gas-filled" lamps give off some rays which are distasteful in some way to moths, than that they lack some attraction present in the "flame arcs." I know nothing of the technicalities of electric

lighting, but the fact that the new lights give a somewhat whiter light than the old ones suggests that there may be more ultra-violet rays in the former, and these rays are known to be unacceptable to some insects, *e.g.* ants. This opens up a very interesting aspect of the attraction of light for insects, and perhaps Mr. Tarbat can get some definite information on the comparative composition of the respective lights.—C. NICHOLSON.

NEW BEES FROM MADEIRA.—In a paper published in the 'Proceedings of the Entomological Society of Washington,' vol. xxiv, No. 1 (January, 1922), Prof. T. D. A. Cockerell describes four new species of bees from the Madeira Islands. These are *Halictus wollastoni*, *Andrena maderensis*, *A. portosantana* and *A. wollastoni*. Excepting *A. portosantana* all are in the British Museum.—R. S.

BOREUS HYEMALIS, LINN. (NEUROPTERA).—In the 'Trans. Ent. Soc. Lond.,' January, 1922, will be found a paper by C. L. Withycombe, B.Sc., giving a full account of his breeding of this aberrant member of the Neuroptera (or Mecoptera, if it is preferred to constitute the Panorpas and their allies a distinct Natural Order of the Insecta). One peculiarity of this insect is that it appears as an imago in November and continues as such in December and possibly longer. The larval period extends from December till August. *B. hyemalis* is a small insect—from 3 to 5 mm. long. The male has four bristle-like wing-remnants; the female is wingless, and has a long ovipositor somewhat resembling that of the Locustodea amongst the Orthoptera. Both sexes possess the Panorpid "beak." Through all its stages *B. hyemalis* lives in moss, especially *Mnium hornum*, Linn. The larva also feeds on moss, but the food of the imago consists of animal juices,* although apparently it does not attack living insects. The paper is illustrated by good enlarged figures of the larva and of the male and female imagines, while a photographic plate shows all stages on a smaller scale.—W. J. LUCAS; Kingston-on-Thames.

THE FARN COLLECTION OF BRITISH LEPIDOPTERA.—It is given to few men to spend so many years of a long life in the formation of a collection of British Lepidoptera as in Farn's case. For little short of three-quarters of a century he was an assiduous worker in the field; he also lost no opportunity of adding any remarkable specimen that came in his way to his cabinet. Sabine, too, was a diligent worker throughout the greater part of his life, more particularly among the butterflies, and at his death Farn acquired his collection and amalgamated it with his own. The auctioneer was therefore justified in saying, when he offered the first portion of this collection at Stevens's Auction Rooms on February 14th, that it contained many "choice lots." The best *Papilio machaon*, a light form, made £4, while the whole series of *Pieris brassicae*, which included several specimens showing minor variations, went for 16s. *Pontia daplidice* in couples sold for 35s. to 55s. per lot, and a very nice one by itself

* After more recent observation, Withycombe considers that *normally* the imago, as well as the larva, feeds on moss.—W. J. L.

for 50s. Of *Pieris rapae* in lots of about fifty, the best, which included a deep cream-coloured female and forms with united spots, made 32s. 6d., but a single very dark *P. napi* ran up to £9. *Aporia crataegi* in lots of eight or nine sold for 12s. to 16s. per lot. A lot of forty *Leptesia sinapis* which included one cream-coloured male made £4, and another in which was a very white specimen with tips of fore wings creamy £3 5s., while a male *Gonepteryx rhamni* with the costa of left fore wing and most of the hind wing of female coloration sold for the like amount. A female *Euchloe cardamines* with large blotches of orange colour on each of its fore wings made £8, and another with orange streaks on its underside 40s. The series of *Colias elusa* contained many nice forms but nothing of outstanding peculiarity, and the best, a very dusky specimen, in a lot of two, brought £4 10s., others ranging from 30s. to £3 each, while nice forms of *C. heale*, generally in lots of two or more, went for round about two to three guineas. Good forms of *Dryas paphia* ranged round £4, an exceptionally dark and somewhat rayed specimen ran up to £12, a practically black var. *rubripes* £17, and the only really remarkable *Argynnis adippe*, a silvery creamy-white specimen, £20. A fine black *A. aglata* with rayed borders made £13, and three undersides more or less of the *charlotta* form, £3, £4 10s., and ten guineas respectively. There were nearly a score of well-authenticated *A. lathonia*, and they sold for from 22s. to 52s. 6d. apiece, while an exceptionally fine dark specimen ran up to £8. A fine dark *Brachis seleno* with silver-rayed underside made £8 10s., and a light black blotched specimen £6 10s. Pale forms of *B. euphrasque* did not exceed £3, but the most strongly black-marked ran up to £6 10s., £8 10s., and ten guineas: while a remarkable underside with rayed hind wings brought £8 10s. The only really remarkable *Melitaea cinxia* made £6 10s., and good forms of *M. athalia* £4 10s., £5 10s. and £6. Two lots, including among other species the one eighteen and the other eleven specimens of *Araschnia heca*, made only 18s. and 12s. respectively. A curious specimen of *Pararge carthus*, described as a "unique white var.," ran up to £16, and a *P. atalanta*, in which the white markings were much "smeared" with black, to £10. The eleven specimens of *Euclyptus antopa* ranged between 30s. and 50s. each. The only two *Vanessa* in lots sold singly were remarkable aberrations and fetched £6 and £7 10s. respectively. A silvery-white *Polygemma e-album* ran up to £21, and one with confluent blotches made £10—both specimens were taken by Farn in 1914; other forms, varying slightly from type, sold for 25s. to 55s. each. *Aglais urticae* with confluent costal blotches and the like brought £2 2s., £4 15s., £5, £2 10s., £2 5s., and 16s. each, and a very pale specimen £1 15s. Black *Limenitis scilla* made from a guinea to 50s. each, a fine *Anatara iris* of a similar form £11, and another not quite so good £4 10s., while fine typical specimens of the species in lots of five went from 24s. to two guineas per lot. The feature of the sale was a black *Melanargis galeata*, which quickly ran up to the record price of £32. A lot which included a pale buff male *Euphydryas aurina* brought £3, one with a cream-coloured specimen £4 10s., a golden-brown male the same price, and a "white underside" 50s. A curious pale golden-ochreous form of *Aphantopus hyperanthus* made £7: a

specimen with broad light borders to ocelli 70s., with lanceolate ocelli 25s. and 30s., and a pale golden male of *Epinephele tithonus* 70s. The total of the day's sale was, in round numbers, £750.—R. A.

THE SALE OF DR. CHAPMAN'S LIBRARY.—This sale, which took place at Stevens's on March 15th, was a notable entomological event, for such an assemblage of books treating on the science has not been seen in the auction rooms for many years. "The Doctor," in his choice of books as in everything else, was philosophical. It was his invariable custom, before making up his mind on any subject that was being studied, to find out everything possible about it and to become acquainted with everything important that had been written upon it; and therefore it was necessary for him to have an exhaustive library of the subjects of his studies at hand for reference. He had for this reason acquired practically all the books dealing with the Lepidoptera of various parts of the world; all the more important works on the other orders: and a large accumulation of books on other sciences, apart from entomology. The gathering of buyers was not what might have been expected for such an occasion, and the dealers, as has unfortunately too often been the case, reaped a rich harvest. Whilst some of the lots, and especially those embracing important British works, fetched fair prices—for there was competition here—others, especially the long series of foreign magazines and the publications of scientific societies, were practically given away. Amongst some of the more important lots and prices were the following: Curtis's 'Brit. Ent.' complete—£3 10s., about one-fifth of its value; Stephens' 'Brit. Ent.' £3; Barrett's 'Lep. Brit. Isles,' the large paper edition with coloured plates, £18; Buckler's 'Larvæ' fetched £9—this figure is within a few shillings of its price as issued to subscribers; 'British Aphides,' Buckton, £4 15s.—the issue price was £4 4s.; Fowler's 'Coleoptera of the Brit. Isles,' £12; Stainton's 'Nat. Hist. Tineina,' £2 15s.; Saunders' 'Hemiptera,' £2 15s.; 'Aculeate Hymenoptera,' by the same author, £3 15s.; Verrall's 'Brit. Diptera,' all parts issued, £3 5s.; Harris' 'Aurelian,' a fine copy, £3 10s.; another copy, £1 15s.; 'Novitates Zoologicae,' 25 vols., £8! Amongst the British magazines the following prices were obtained: 'Entomologist,' the first 36 vols., including the rare vol. i (1840), £7 10s.; another series, 1887 to 1920, £5; 'Ent. Mon. Mag.' 1864–1921, £9; 'Ent. Record,' 32 vols. (all issued), £5; 'Ent. Intelligencer,' 10 vols. (all issued), £1; a complete set of the 'Transactions of the Entomological Society of London' sold for £21—about half what it usually fetches. The slump in foreign magazines and publications of foreign societies embraced the following: 'Stettiner Ent. Zeit.' 72 vols., £3! 'Annales Soc. Ent. Belgique,' 59 vols., £3! 'Annales Soc. Ent. France,' complete, 91 vols., £3! 'Berlin Ent. Zeit.' 58 vols., £5. The only non-British magazine that produced a fair value was 'Iris,' of which 35 vols. were sold for £8 10s. I suspect the reason for this was that a certain well-known entomologist, who I know wanted a copy, purchased it. The tragedy of prices was, however, reached in the sale of a very fine copy of Hübner's beautiful 'Sammlung Europäisches Schmetterlinge,' which was sold to a well-known dealer for

£16!—entirely because there was no opposition. The copy, which once belonged to Dr. P. B. Mason, is not likely to be resold at under £60, and but for the fact that one cannot very well acquire duplicate copies of these beautiful but expensive books, the writer would have felt inclined to give the purchaser a run for his money. Hübner's 'Larvæ,' an imperfect copy, realised £9, and his 'Exotic Butterflies,' the modern "Wytzman" edition, £11. The other great German work, Herrich Schäffer's 'Bearb. Schmett.,' had a better fate, and went to adorn the library of one of our best-known lepidopterists, the price paid was £42. Even this, however, was very considerably less than the last copy brought to auction realised, and which was acquired by the writer at Godman's sale. The book is valued in Quaritch's Catalogue at £63. Another ridiculous price was Roesel's beautiful 'Insecten Belustigungen,' which actually changed hands for £4. What are so many of our wealthy Lepidopterists thinking of? They pay £20 or £30 for a variety of a butterfly that has not even the merit of being unique, and is much more abundantly met with in Continental Europe than with us, and yet they allow these most beautiful and interesting old books, which are the vital literature of their science, to pass to the dealers for one-fourth of their current value without making an effort to secure them! There is no doubt but that these books will greatly enhance in price in the not far distant future, as culture becomes more general, and they get scarcer. It must be borne in mind that they were only issued in very small editions. Take Hubner's 'Sammlung,' for instance: in my copy the number of subscribers is given as sixty-nine, and although it is believed others were afterwards added, the total number is not likely to have exceeded 100. We have in Britain, so far as I know, about a dozen copies, of which the majority are in libraries, and the book is much scarcer abroad than with us. It seems pretty certain that in a few years the four or five copies still in private hands will be absorbed into public institutions or sold to Americans. One would think that even to the variety collector such books would appeal, for apart from their merit as representatives of an age that justly prided itself on the exquisite quality and conscientiousness of its work, which will never be reproduced or equalled, the figures are quoted extensively in all the literature of our science, and therefore, if the subject is to be understood, copies must be held for reference. Of course they cannot be borrowed; no library possessing a copy will loan it out on any consideration. Cramer and Stoll, 'Papillons Exotique,' realised £10 10s., and the beautiful 'Lépidoptérologie Comparée' of Oberthur £43. 'Genera Insectorum' reached £20, and Seitz's 'Pal. Lep.' £4 6s. A remarkable purchase was that of Culot's 'Noct. et Geom. d'Europe,' only just completed. The exquisite figures—thousands of them—are hand-coloured by the premier entomological artist of the day, and the cost of the work to subscribers has been about £20. It was bought for £7! Another remarkable bargain was Godart et Duponchel's 'Hist. Nat. de Lep. de France,' usually listed at about £25. The price on Wednesday last was £4! Snellen (Sepp) 'Nederland Insekten,' four volumes, complete, was acquired by the writer for £6. Trimen's 'South African Butterflies' sold for £3, and Hewitson's beautiful 'Lycenidae' for £3 10s. only! Of

Boisduval's 'Icones' there were three copies, which realised £3, £3 3s. and £3 respectively, whilst the only copy of the same author's 'Chenilles' was purchased by the writer for £4 15s. Leach's 'Butterflies of China' sold for £4 10s. The total realised was £731 9s. 6d., which sum ought to have been doubled. A considerable portion of the library was acquired, by the courtesy of the Misses Chapman, for the Entomological Society, and this, of course, did not figure in the sale.—W. G. SHELDON; March 18th, 1922.

RECENT LITERATURE.

Catalogue of Indian Insects. Part I—Acrydidæ (Tettigidæ). By T. Bainbrigge Fletcher. Calcutta, 1921.

HERE we have the first instalment of what promises to be a most useful publication. In addition to the actual catalogue, which itself contains a certain number of notes, we have a bibliography of Indian forms, a short account of the family, and a key to the sub-families as far as India is concerned. In all 169 species are enumerated, one only of which, *Tetrix* (= *Acrydium*) *bipunctatus*, Linn., is British. This family is usually considered to be part of the family Acrididæ (= Acridiidae or Acridiodea of most authors). If, therefore, these grasshoppers, with no pad between the claws and with elongated pronotum, are constituted a family in themselves, the name Acrydidæ, named from the genus *Acrydium* (= *Tetrix*), which appears to be but an incorrect spelling of *Acridium*,* is rather confusing to say the least. To raise the sub-family Tetriginæ to the family Tetrigidæ (or Tettigidæ) would seem to be preferable. W. J. L.

OBITUARY.

LACHLAN GIBB died March 1st, 1922, aged 68 years: thus ran the legend that we read when we laid him to rest in Charlton Cemetery on a beautiful spring day such as he would have loved. A man of wonderful energy, too great perhaps for his bodily strength, for he was not a very robust man, he was throughout his life actively engaged in business, yet he found time to devote to his two chief recreations, his garden and the Lepidoptera, in both of which he took a keen interest from very early days. He had considerable business interests in Canada and spent some years of his life in that colony, during which he made many entomological friends there, with whom he was enabled to keep in touch almost to the last by reason of his visits to Montreal, which after his re-settlement in this country it was his custom to pay regularly every year.

Gibb made no profession of scientific study and it is doubtful if he personally ever made any contribution to literature, although

* Greek, Ἀκρίς = a locust. Schrank and Zetterstedt use the correct derivative, *Acridium*.

in his frequent letters to correspondents he often conveyed much useful information. His joy was to see the living creature in the field, and to this end he made many arduous journeys both in this country and in Canada. In this wise, some thirty-six years ago, he, in company with the late W. H. Tugwell, set out for Aberdeenshire in search of the then little known *Zygaena erulans*, and not only found the species freely, but brought back much useful information as to its locality and habits (see 'Entom.,' vol. xix, p. 217). Again, soon after *Lycaena arion* was turned up in Cornwall, he wrote to the present writer from Montreal that he was coming over by a certain boat and would meet him in Exeter on a specified evening. "I must see that big blue alive," he wrote. We met in Exeter; we, thanks to friends we fell in with, found the "big blue," indeed, we took quite a number in the one day that we were able to devote to it, and by the evening he had posted the majority of them alive to friends at a distance who, as he said, had not the opportunity of seeing the species for themselves. That was the man! it was never any question of exchange with him, he simply wished to give his friends a share in his own delights.

It was in the spring of last year, while on one of his usual visits to Canada, that he was stricken with the disease that ultimately proved fatal, but on his return to this country, although in an enfeebled condition, the call of the wild was too strong to be resisted, so he set forth for the scenes of his early pleasure with his grandson, a lad of twelve years. They went to Braemar and again found *Zygaena erulans*, they crossed to Argyleshire and got *Z. achilleae*, and returned much elated with their success, but it was the last trip he was to make.

He was elected a Fellow of the Entomological Society of London in 1913, having previously, in 1884, joined the South London Entomological and Natural History Society, and was its frequent benefactor.

It was but a short time before his death that he called the present writer to his bed-side: he was too weak for any lengthy conversation, but he said, "Do encourage the youngsters to take up entomology: it has been such a help to me." So he passed away in peace, and will be missed by a large circle of friends both on this and the other side of the Atlantic.

R. A.

THE ENTOMOLOGIST.

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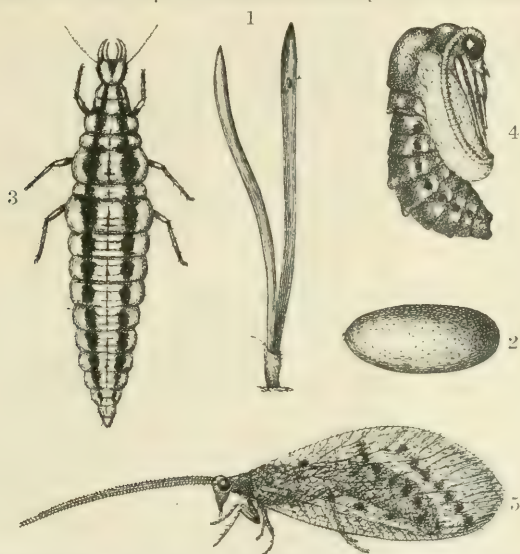
MAY, 1922.

[No. 708

THE LIFE-HISTORY OF *HEMEROBIUS STIGMA*, STEPH.

BY C. L. WITHYCOMBE, B.Sc., F.E.S.

As there have been several records recently of *Hemerobius stigma* being taken in the early part of the year, the following short account of the life-history of this insect may be of interest.



Hemerobius stigma, Steph.—Fig. 1: Pair of pine needles showing positions in which eggs are laid (indicated by arrows), natural size. Fig. 2: Egg, $\times 30$. Fig. 3: Larva, $\times 6$. Fig. 4: Pupa, $\times 6$. Fig. 5: Imago, $\times 4$.

Hemerobius stigma is perhaps one of the most variable of all the brown lacewings, one form common in summer having warm brown wings practically devoid of markings, while the other extreme has greyish-brown, much spotted wings. The last form is in my experience the only one found in winter, but during the warmer months all varieties may be taken. The species is easily captured by beating conifers. On falling into the tray the insects either feign death, bending the antennæ with the legs under the body, or they may jump about for a second or two with a peculiar hopping motion, finally walking away and taking to flight. They are not strong flyers, and are rarely long on the wing. The adults feed on aphids, honey-dew, etc., and, in some cases observed, live for at least eight weeks.

On emergence from the cocoon the eggs in the ovaries are not fully developed and egg-laying does not commence for three or four days, sometimes a week. Eggs are laid singly, attached by their sides to a surface, but sometimes in groups of up to seven in number. The favourite positions are (1) a quarter of an inch from tip of pine needle on inner flat face of same; (2) under the scaly wrapping at the base of a pair of needles and hidden from view. In the first case the female crawls up the needle until the tip is reached; then, on finding she can go no further, the egg is deposited at her body's length from the tip. Less often eggs are laid anywhere on the twigs and needles.

Description of egg.—Size 7 mm. $\times$ 3 mm. Elongate oval, rounded at both ends, but varying slightly in shape. The surface is smooth, broken by many small granular pits. At the micropylar end of the egg is a small white knob. Colour yellowish white when first laid, but in about six days (at 60° F.) colour darkens to orange brown, and a day or so before hatching the eyes of embryo are visible as black dots through the shell at the micropylar end. Average length of egg stage is 9 days at 60° F., or 27 to 36 days in winter at 45° F. approximately.

The larva makes its escape by a small irregular rent in the egg-shell, and is at first of a pale yellowish colour. In two or three days the head markings appear, sometimes also markings on the body, but these latter are usually only visible in the second instar.

Description of third instar larva.—Body almost naked, fusiform, cream-coloured, pale brown or pink, with two longitudinal chocolate-coloured bands. Head dirty white with a brown wedge-shaped central mark widening from behind forwards. Sides of head brown. Eyes black. Antennæ blackish, as also are labial palpi. Jaws dark coloured, brown or blackish, composed of mandibles and maxillæ united to form a tube through which juices of victims are sucked. Body colour is variable, usually creamy white. There is a fine median dorsal dark brown or black longitudinal line, a pair of dorso-lateral longitudinal chocolate-coloured bands, which may be continuous or interrupted at each segment or barely visible. Generally there is also a lateral brown line on each side. Embedded in the dorso-lateral bands of the three thoracic segments are paired shiny greyish-brown sclerites—attachments for muscles. The legs are smoky white in colour, black at the knees; tarsi also darker.

Length of larva when full fed about 7 mm. There are three larval instars.

Contrary to general opinion* the larvæ of *Hemerobius* do not cover themselves with skins; the habit is, however, characteristic of some species of *Chrysopa*.

* McLachlan, 'Mon. Brit. Neur. Plan.', p. 175, 1868, and 'Cambridge Nat. Hist. Insecta,' pt. i, p. 468.

It is impossible to give, in a brief note such as this, sufficient details to distinguish the larva of *H. stigma* from that of other species. The present description would answer almost as well for larvæ of such distinct species as *H. humuli* and *H. lutescens*: but of course these larvæ are rarely found on pines. Colour in Hemerobiid larvæ is extremely variable, being due largely to the colour of internal organs.

During the greater part of the year larvæ may be found on pines, where they feed on aphids, leaf hoppers, and mites, piercing these with their jaws and sucking out the juices. The larva runs actively with a slight side-to-side motion of the head, the tip of abdomen being used as an additional leg. When at rest it has a habit of lying stretched out along a needle with its head towards the base. The period of larval life varies from 22 to 28 days with an average temperature of 65° F., or 46 to 50 days with a temperature averaging 50° F. When full fed a crevice in the bark or between two needles is sought out and here a loose cocoon of silk is spun, the anal extremity being used as a spinneret.

The cocoon, as in other Hemerobiids, is quite a loose structure of elongate oval shape. In from eight to ten days after spinning the pupa is disclosed. This is at first of a yellowish colour, the eyes and back being brown. All the characters of the adult are now visible, the legs held close together ventrally, the wing rudiments at the sides and the antennæ lying over these and curling ventrally. In from one and a half to three weeks, according to temperature, the pupa has darkened wholly to a deep brown colour, and from now onwards the imago may emerge any day. In summer emergence takes place very shortly after this darkening, but in cold weather the pupa may rest for weeks in this condition or may even pass the winter as such. This is, in fact, the stage in which the coldest weather is passed, but a warm spell even in December or January will cause the appearance of the adult fly.

The pupa struggles for a time within its cocoon, the legs and antennæ being now free, then tearing an irregular hole with its mandibles, it emerges and crawls on to a suitable support. Here the pupal skin is cast and the insect commences adult life. Pairing takes place in a day or so, usually at night, the insects being of nocturnal habits mainly.

Eggs may be laid directly they mature, but in winter only on warm days; these then hatch according to the prevalent temperature, as has been shown.

We see then that this species is really on the wing all the year round in a normal season. At no period have I found its food completely absent, species of *Lachnus* and *Eulachnus*, besides various Psocids, being always procurable, even in the hardest of winters.

NOTES ON *COLIAS CROCEUS*, FOURC. (*EDUSA*, F.)
IN MESOPOTAMIA AND NORTH-WEST PERSIA,
1918-1921.

BY LT.-COL. H. D. PEILE, I.M.S.

I HAVE been much interested in reading Mr. Rowland-Brown's paper on *Colias croceus* in the 'Entomologist' for June (etc.), 1921. I tried while in Mesopotamia in 1918-21 to get a good series of this species, besides others, and when in England selected some for setting, and of these Capt. Riley took 150 for the National Collection. On seeing Mr. Rowland-Brown's article I thought readers of the 'Entomologist' might be interested in this series of *croceus*, such as I was able to capture, and that the rough notes taken from my field note-book might also be of some interest as giving some idea of the appearance of the different broods, and proportion of white to yellow females seen and taken by me. There was much variation among captures on one and the same day at the same spot.

It has always seemed curious to me that although a white form of the female occurs so often among the species of *Colias*, and this form of the female is so common in Mesopotamia, I have never, so far as I know—and I have collected in India since 1908—come across a white female of *Croceus fieldii*, Men.; and I doubt, therefore, the accuracy of Leech's statement in his 'Butterflies of China, Korea and Japan,' that he took a white female of this in Kashmir.

COLIAS CROCEUS IN MESOPOTAMIA AND NORTH-WEST PERSIA.

1918:

May 23.—(Amara.) Very common.

„ 24.—(Amara.) One large white ♀ h.w. all grey, with white centred discl. spot; f.w. grey at basal third. Also a small white female quite different from the above large specn. taken a few minutes before at the same spot.

June 9.—(L. bk. R. Dyala at Jebel Hamrin.) ♂ recognised as brighter orange than usual on the wing, and having white centre to blk. d. spot present though smaller than in *fieldii* (of India).

„ 15.—White ♀ and ♂ orange yellow above and without white centre to f.w. discl. spot beneath.

„ 18.—White ♀ taken.

„ 19.—White ♀ taken, small and damaged.

„ 22.—Large ♂ taken.

July 3.—Pair taken *in cop.* ♂ orange-yellow without any white centre to discl. spot, ♀ white similar to other white females captured here.

- July 5.—Three yellow ♀ ♀ taken, one with large yellow spots on band, one with a few spots slightly indicated, and one with medium spots.
- „ 6.—Large ♂ with white centre to large blk. spot, and another with small plain blk. spots on f.w.
- „ 7.—♀ ovipositing on a common vetch on bank of R. Dyala; this one has indication of pale centre to blk. spot on U.f.w.
- „ 14-17.—(Karind valley, N.W. Persia.) Common both at 5300 ft. and at 6000; U.f.w. discdl. spot plain blk. and large, discdl. cell yellow anteriorly, orange posteriorly, remainder of U. very green.
- Aug. 7.—(Paitak Pass, 2500 ft., N.W. Persia.) ♂ and white ♀ taken.
- Sept. 10.—(Kd. valley, 5300 ft.) *Helice* white ♀, *very fresh*, taken.
- Nov. 16.—Dark *helice* white ♀ chased.
- „ 17.—Worn yellow ♀ taken.
- 1919:
- Jan. 24.—(Kizil Robat, R. Dyala.) Several seen, worn yellow ♀ taken.
- „ 25.—1 ♂, 1 ♀ in *fresh state* taken.
- Feb. 2.—White ♀ taken, the first seen this year.
- „ 11.—Common.
- „ 19.—Common, 1 ♂, 2 ♀ in *very fresh state* taken.
- „ 22.—Several taken.
- „ 25.—Very common, white ♀, one very worn.
- „ 28.—Common.
- Mar. 20.—One ♂ with minute white centre to blk. discdl. spot.
- „ 27.—Fine orange ♀ taken.
- „ 29.—*Freshly emerged* and very common; one ♂ found on fd.-plt. (small trefoil) with its wings not yet dry. One pair in *fresh state* taken in *côp.* One white ♀ seen.
- April 1.—Very common in *fresh state*. Several of both sexes taken and one white female.
- „ 3.—Two white ♀ ♀ taken, ordinary yellow f. very common.
- „ 6.—Very common, many very fine and fresh females, especially at white scabious-like flowers. One white ♀ taken.
- „ 10.—Very common, many very fine ♀ ♀ about; six white ♀ ♀ taken.
- „ 21.—Abundant. Three white ♀ ♀ taken, others seen. One of these three was taken in *côp.* with *croceus* ♂. About 8 a.m. one is very likely to put up two or more white ♀ ♀ about stony slopes near the camp.

May 21.—(Kizil Robat.) ♂, bright orange upperside and yellow U.

June 28.—White ♀ seen; yellow-orange ♀ with white centre to discal. spot on U f.w. taken; a very brightly coloured ♂ seen.

July-Oct.—(Busy at Kirkuk.)

Nov. 3.—(Baiji, Rt. bk. R. Tigris.) Several rather worn seen.

„ 6.—Very common in worn state.

1920:

May 25-26.—(Baiji.) Larva pupated (♂ *croceus* emerged 1 June). Fd.-plt. lucerne.

June 3.—Very common about lucerne; white female taken *in cop.*, two other white ♀ ♀ taken, one ovipositing on lucerne. Yellow female also seen ovipositing. Does not pause long to lay the egg; egg laid singly on middle of half of upperside of medium-sized leaf.

„ 4.—V. common about lucerne: pair (both sexes yellow) taken *in cop.*, the female being in very fresh state. Another fine fresh female being courted by two males, and *apparently recently emerged*, taken.

Two white ♀ ♀ taken having much grey about them above. Yellow female seen ovipositing on lucerne.

„ 8.—Very common, seven white females taken and some very fine males.

„ 9.—One white ♀ taken and another seen.

„ 13.—At lucerne; one very good example of true *helice* form, cream coloured with tinge of orange about the post. margin of the fore wings; grd. col. beneath yellow. The only true *helice* yet taken here, although white females are common, and it is quite distinct from these. Several white females were taken in about half an hour (8.30 to 9 a.m.) at the same spot. This *helice* female laid several eggs of the usual spindle shape in the paper envelope.

„ 15.—A white ♀ with large amount of grey at base of f.w., but orange discal spot on h.w.

„ 19.—White ♀ taken, another seen.

About 6 p.m. took a remarkably large white female. Took larva of *croceus* this morning on lucerne.

Colour uniform dark green matching very well the colour of the lucerne leaves, lateral white line with red dot on it at each segt. With a temperature of 114° inside my tent this larva was not happy inside an inverted tumbler with plant in water. In the cool of the evening it showed a little more sign of life when put on lucerne inside an old net.

June 20–21.—This larva pupated, head upwards on main stem of lucerne plant; colour, semi-transparent green (pea-green), a little lighter than the lucerne leaves. White lateral line along thorax and abdomen, with dark brown dorso-lateral mark as in the other pupa. The colour closely resembles that of the leaves around it.

„ 26.—Markings of female *croceus* conspicuously showing through the pupal skin, and the butterfly emerged about 5 a.m. 27th.

1921 :

Oct. 28.—(Baghdad.) *Colias croceus* seen.

Nov. 9.—(Baghdad.) *Colias croceus* male taken in worn state.

„ 10.—Six seen in garden, three at one time.

„ 15.—Remarkably common in garden in last few days.

„ 28.—Male seen courting settled female, both worn specns.

Capt. N. D. Riley, having selected a series of 150 of my specimens, as stated above, for the National Collection, writes of them as follows :

“A magnificent species. The Persian specimens cover the dates 14/7/18–10/9/18. The Mesopotamian series represent captures in nearly every week of the months January–July (middle). As regards size they range from an expanse of 3·7 mm. (♀ Jebel Hamrin, 3/7/18), to 5·4 (♀ Amara, 26/5/18). The January and February specimens are noticeably and consistently smaller than those of any other month, with the exception of the one very small female mentioned above, and an exactly similar one from same locality dated 10/6/18.

“The amount of variation in colour and markings is remarkable. One male (Kizil Robat, 22/3/19) has ground almost lemon-yellow instead of orange; some examples in which all the veins are marked with yellow across the outer marginal border are referable to ab. *faillae*, Ste.

“Of the females, almost exactly 33½ per cent. [of those selected] are of the white *helice* form; two of the f. *aubuissoni*, Caradja, intermediates in which the yellow has failed; one of the ♀ f. *helicina*, Oberth., an intermediate form in which the red pigment is absent, leaving the specimen a delicate lemon-yellow.

“For the rest no two specimens are alike, so it would serve no useful purpose to go into details.”

Mhow, India;
January 31st, 1922.

TRICHOPTERA IN DORSET.

By F. H. HAINES, M.R.C.S., L.R.C.P.

THE following species of Trichoptera were met with during some seasons in which attention was paid to this Order in the Wareham district. *Phryganea grandis*, Linn., common round the lake in Morden Park in May and early June, resting by day on trees and other objects near. It associates itself pleasantly with the spirit of the spring morning. *P. striata*, Linn., occurs with it, but less commonly. It is found also among the osier beds of the backwaters of the Frome. *P. curia*, Fab., is abundant in July, especially at Morden, hiding in the crevices of fir trees growing near heathland ponds. *Colpotaulius incisus*, Curt., is found on Tadnoll marsh in May, harbouring in the coarse growth to run up the rushes fast and fly a short way if disturbed. *Glyptotaelius pellucidus*, Retz., is very abundant, breeding in the small ponds found in copses as well as in the larger existing in certain woods. It shelters in the very low bushy branches of the oak trees round its haunts, and is most numerous in early summer. The commonest species of *Limnophilus* are *L. marmoratus*, Curt., *lanatus*, Curt., *centralis*, Curt., *affinis*, Curt., *auricula*, Curt., and *sparsus*, Curt., most of them abounding. *L. marmoratus* frequents rivers in summer and early autumn, and is very common on the Frome and also round the lake (through which a stream runs) in Morden Park. *L. lanatus* inhabits the still waters of ponds and marshes throughout the area chiefly in late summer and autumn. *L. centralis* is found near standing waters, but also far away from even a pool in the fir-woods. McLachlan suggested that it might breed in spongy bogs where there was no surface water. Judging from the positions in which *L. auricula* and *sparsus* are found, also often in woods, distant from anything beyond puddles and damp hollows, they may breed in these spots amid dead leaves in very shallow water, which is occasionally reduced to mere dampness. Abounding everywhere *auricula* occurs from May to autumn. *Sparsus* is largely a May and summer insect, but it continues later. They are easily secured by shaking pine branches into a net in the fir districts. *L. affinis*, considered rather a woodland species, occurs in numbers amid the *Spartina* and other growth on the shores of Poole Harbour: evidently a maritime tendency is not exceptional. It occurs earlier, but I have met with it most freely in autumn. *L. rhombicus*, Linn., is commonest in June about Morden Park lake in the reeds and rushes. *L. elegans*, Curt., occurs rather uncommonly at Morden near heathy swamps, and it is to be beaten out of the lower branches of oaks where the woods and heathlands meet. I have taken *L. griseus*, Linn., in Coombe Wood and near Tadnoll marsh in April

and May, but it is not common. *L. luridus*, Curt., another rarer species, occurs in June and July about ponds at Morden, East Lulworth, and on the backwaters of the Frome at Ilford, evidently breeding in either still or slowly moving water. These three species are local. *Anabolia nervosa*, Curt., is very abundant on the Frome system and also on the Morden Park lake at the entry and outfall of the stream. It may be seen in multitudes running up the flags and rushes evidently when first hatching out, on bright warm days from early to late fall. It will even settle on the collector sitting by. At other times the insect hides by day in the bank growth. *L. rhombicus* has a similar habit. Of species of *Stenophylax*, *stellatus*, Curt., is far commoner than *latipennis*, Curt., coming to light freely like the very common *permistus*, McLachlan. *S. stellatus* is found mostly in September, occurring often in Winfrith, bred from the village brook, also on the Frome and on the Puddle at Carey. *S. latipennis* occurs at Iford in September. Nearly all my specimens of *permistus* have been taken in April and May, perhaps hibernated. It occurs freely at Winfrith, Bockhampton, and along the Frome, often harbouring of a day in outhouses. *Micropterna lateralis*, Steph., occurring along our heathland brooks in June in those spots "that seem to lie sacred to flow'rets of the hills, and sacred to the sky," is retiring and seldom seen. *Halesus radiatus*, Curt., is very numerous by streams at Morden, Moreton and Iford. *H. digitatus*, Schr., is not so common, but occurs on Winfrith Heath by the Frome. These species sometimes dance gregariously in the sunshine. They often come to light at night. *Drusus annulatus*, Steph., has occurred in May on our Winfrith brook, although this is but very rarely swift. It is not common. I have no record of *Chaetopteryx villosa*, Fab., from this area, though it will surely occur on streams here, as in other parts of Dorset, from early to late autumn. The variable *Sericostoma personatum*, Spence, is abundant on all the rivers, and lends some animation in summer to many a stream as it wends its way through the green pastoral tracts. I have seen it ovipositing in the pond in Morden Park. Like most of the Sericostomatidae it does not travel far from the water, and flies by day and of an evening readily. *Notidobia ciliaris*, Steph., is abundant, especially in May, at Lower Bockhampton, Iford and Moreton, and is of similar habits, and very noticeable, resting on the herbage. *Goera pilosa*, Fab., is common in June and July at Iford and Moreton. *Silo nigricornis*, Piet., is another frequent species flying over rivers in the sunshine at Moreton, Stafford, and Bockhampton, notably in May, but also later in the season. The whole family tends to be diurnal. *Lepidostoma hirtum*, Fab., another of our common river caddis-flies, is found at East Stoke, Holme and Moreton in July, August and September. *Brachycentrus subnubilus*, Curt., swarms on the Frome in April and May, sporting

in crowds over furze bushes by the banks at Iford. I have found it on the flowers of Umbelliferae, so that evidently, as with *S. permistus*, which comes to sugar, and *L. bipunctatus*, which comes to ivy-blossom, the mouth apparatus is not entirely atrophied. The species of *Beraca* occur in the various backwaters and ramifications of the Frome, where the water is slow, shallow and full of plant-growth, particularly in spring and early summer. I have taken, especially in May, *Beraca pullata*, Curt., at Iford and Tadnoll, *maurus*, Curt., on Winfrith Heath, and *articularis*, Pict., at Tadnoll, to quote but a few localities for these insects. *Beracodes minuta*, Linn., occurs at Morden in May. *Molanna angustata*, Curt., is common at Tadnoll and Morden in May and early June, and may be taken resting by day like a Crambite, but with the legs out sideways, on the walls of the open boat-house by Morden lake, as well as at the roots and on the stems of reeds, rushes and flags, where they stand thickly by the water. *Odontocerum albicorne*, Scop., is not common. I have taken it by the Puddle at Culeaze on herbage. *Leptocerus aterrimus*, Steph., is very common on the pond at Morden Park in June. *L. cinereus*, Curt., is abundant in July on the Frome and its branches at East Stoke, Moreton and Tincleton. It often flies in large clusters just above the water in the quiet of the evening. *L. albifrons*, Linn., occurs freely by beating the trees just below the mill at East Stoke in July and August, as does, more rarely, *L. dissimilis*, Steph. *Mystacides azurea*, Linn., is abundant on backwaters and ponds, with a current through them, as at Morden and East Lulworth, from May to August. *M. longicornis*, Linn., is common round Morden Park Lake in May and June. *Triacnodes conspersa*, Ramb., is not uncommon at East Stoke mill, Holme Bridge and Moreton in July and August. *T. bicolor*, Curt., a pond species, occurs at Morden Park in July, as does *Adicella reducta*, McLach., a water-fall species, in June. *Oecetis ochracea*, Curt., is very common amongst the rushes round the large pond on Morden Heath from June to September, flying fairly fast, if awkwardly, over it of an evening. I find *O. testacea*, Curt., chiefly near East Stoke mill on the mill-stream, also at Tadnoll in July and August. Hydroptilidae are apt to come to light in multitudes, and by day they may be found running over bridge parapets, lichen-covered stones, and similar objects near water with quick alertness. *Hydroptila sparsa*, Curt., occurs very commonly on the Puddle at Culeaze, at Tadnoll, and on the Frome at Bockhampton in May and June. *H. maculachlani*, Klap., is found freely on the Frome Bridge at Bockhampton. *H. forcipata*, Eaton, is found at Tadnoll and Morden in May and June. *Orthotrichia angustella*, McLach., occurs at Tadnoll in April. *Orgethira costalis*, Curt., is exceedingly abundant at the Morden Park lake. *O. tristella*, Klap., is found at Tadnoll in May, and *O. falcata*, Morton, in the Winfrith neighbourhood. *Hydropsyche pellucidula*, Curt.,

occurs in May and June at Iford; *fulvipes*, Curt., rather particularly known as a Dorset insect, in May, June, and July, at East Stoke, Iford and Bockhampton; *angustipennis*, Curt., from May to September, is abundant at Winfrith and Iford; *guttata*, Pict., from May to August, is very common at Winfrith, Iford and Moreton; the males often dance in groups in sunshine near the Frome, like those of *angustipennis*. *H. lepida*, Pict., is abundant at East Stoke mill in July and August. *Wormaldia subnigra*, McLach. (females only), occurs in August and September at Studland Heath, near a heathland spring, and at Morden at the outfall of the Park lake. *Chimarra marginata*, Linn., is very common on moss-grown boulders, hatches and such objects in May, June and July on the swifter reaches of the Frome at Moreton. *Plectrocnemia conspersa*, Curt., occurs at Morden in May by the rushing outfall and stream from Morden Park lake. It tends to that golden spotted appearance so common in caddis-flies frequenting swift streams, cataracts over boulders, and places where light and shade and spray make such colouring harmonise with the surroundings. *Polycentropus flavomaculatus*, Pict., found at Morden, Moreton and Bockhampton, is extremely abundant from May to September. *P. multiguttatus*, Curt., though also a stream-frequenting insect, is common on the Morden Park lake, but less so than the last. Here also the pond-breeding *Holocentropus dubius*, Ramb., occurs in May and June, and at East Lulworth lake, as does, more rarely, *H. picicornis*, Steph. *Cyrrus trimaculatus*, Curt., abounds at Morden Park lake and at Holme in May, June and July. *Tinodes waeneri*, Linn., is ubiquitous on all our rivers and ponds as at the Corfe River, Morden, East Lulworth, Winfrith, Moreton, etc., from May to September. *Lype phaeopa*, Steph., is often met with, as at Moreton and Morden from May to September, in the slower flowing waters, as is, not rarely, *Psychomyia pusilla*, Fab., at Moreton and Iford from May to September. *Rhyacophila dorsalis*, Curt., is general on all our streams from May to October, even breeding in the small Winfrith brook, whence the imago flies indoors to light. But the species of *Rhyacophila* are usually most at home glancing and flying in the roar, rush and sparkle of tumbling waters amid precipice and peak! *Agapetus fuscipes*, Curt., is very common on the Frome system at Moreton, Stafford and Bockhampton from May to September. I have *A. comatus*, Pict., from Moreton in May, but it is much scarcer than the preceding.

The foregoing will give a total of 73 species found in the Wareham district. C. W. Dale's British list, revised by K. C. Morton in 1907, gave 174 British species. Dale's Glanvilles Wootton list gives 42 species, of which 9 are not in my list: *Phryganea minor*, Curt., *Grammotaulius atomarius*, Fab., *Limnophilus vittatus*, Fab., *Chaetopteryx villosa*, Silo, *pallipes*, Fab., *Leptocerus bilineatus*, Linn., *Mysta-*

cides nigra, Linn., *Agraglea multipunctata*, Curt., and *Micropterna sequeax*, McLach. But as the common *S. permistus* is not recorded at all, it suggests that this species is meant. I have reckoned Dale's *Hydroptila tincoides* as *sparsa*, not *femoralis*, Eaton. *L. vittatus*, *S. pullipes* and *M. nigra* seem curious omissions from my list. *Neuronia ruficus*, Scop., is recorded from Holnest, and *Apatania muliebris*, McLach., from Blandford, bringing the Dorset total to 83. I have a list of 39, most of which, judging from their habits and distribution elsewhere, would probably be found were the county thoroughly worked throughout. This would give Dorset 121 species. The remaining 53 species are probably too northern or alpine in habit, or require haunts of a kind not developed in Dorset, such as wide-spread fen country and broads on the one hand or mountain torrents on the other.

Brackleside,

Winfrith,

Dorset.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

By CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 83.)

5. PROCTOTRYPES PARVULUS, NEES.

Codrus parvulus, Nees, Hym. Mon., ii, 1834, p. 360, ♂ ♀. *Proctotrupes parvulus*, Hal., l.c., p. 14, ♂ ♀. *Serphus parvulus*, Andre, l.c., p. 315.

A little-known species. Germany "in Fungis, præsertim in Boletis circumstante, Mycetophilorum larvis infestato, gregarius; Septembre et Octobre mensibus in memoribus" (Nees); and Finmark in July. Not common in woods during autumn (Haliday); females gregarious in Boleti (Walker). I have bred this species in some numbers from *Boletus-fungi* on old elm-trees about Ipswich: but, as I have already remarked ('Trans. Entom. Soc.', 1907, p. 39), it is impossible to determine if these were parasitic upon the dipterous genus *Cecidomyia*, the beetles *Orchesia micans* and *Phalacrus corruscus*, which were also bred therefrom, or upon *Meteorus obfuscatus* and *Thersilochus orchesiæ*, Morl., which were themselves parasitic upon the above *Orchesiæ*; judging solely by the comparative bulk of these various insects, it is probable that the *Proctotrupes* was a direct parasite upon this Heteromeron. Felden, in Herts, doubtless bred (Piffard); bred from *Orchesia micans* at Luccombe Chine, in Isle of Wight, on May 7th, 1914 (J. C. Pool); several bred from *Diphyllus lunatus* in *Sphaeria concentrica* at Oxford (Lyle), who has proved

the order of its host by breeding both sexes and a nymph during October, 1915, from *Coleopterous* larvæ, to which the parasite is in this case still actually attached. On a single sunflower during mid-September at dusk in Ipswich.

6. PROCTOTRYPES GRAVIDATOR, Linn.

Ichneumon gravidator, Linn., Syst. Nat., i, 1758, p. 565; Oliv. Encycl. Méth., vii, 1792 (*nec*. Thunb.). *Banchus gravidator*, Fab. Syst. Piez., 1804, p. 128. *Codrus gravidator*, Jurine, Nouv. Méth., 1807, p. 309, ♀; Nees, *l.c.*, p. 354; Zett., Ins. Lapp., i, 1838, p. 416. *Proctotrupes gravidator*, Lep. Encycl. Méth., x, 1825, p. 208; Hal., *l.c.*, p. 14, ♂ ♀; Thoms., *l.c.*, xiv, p. 412; Voll., *l.c.*, p. 29, pl. xviii, fig. 3, ♀.

The colour of this species is variable, and Haliday instances examples with femora and antennæ nigrescent, and others with black abdomen and infusate legs, having only base of both tarsi and tibiæ dark ferrugineous; my darkest male, taken at Market Rasen, in Lincs, during June, 1912, has nothing but base of second segment and part of tibiæ dull rufescent. That this species has the power of, at least occasionally, stinging, is proved by W. Rollason, who wrote to me that his little daughter was quite sharply stung by one in his garden at Truro on October 16th, 1909; it "caused a raised white bump, which remained for about four hours."

In sunny fields, frequent everywhere in summer; Sweden, Italy (Haliday); all Europe to Sicily (Kieffer); bred from galls of *Cynips Kollari* by Fitch ('Entom.,' xiii, p. 260), and according to Vollenhoven, from the common British fungus-gnat, *Boletophila fusca*, etc. I have found it a not uncommon species in dry places, such as the coast sand-hills and the "Breck" of N.W. Suffolk; never taken on flowers, but sometimes hiding beneath *Erodium cicutarium* and swept from gorse; rarely sheltering in rabbit-holes. Evenly distributed through the third quarter of the year from June 10th to September 27th, at Foxhall, in 1896, Ipswich, Herringswell, Belstead, Kessingland, Wangford, and common about Brandon at the end of June, especially so in 1918, though a female was once swept from nettles at Belstead so late as October 29th. Copthorne Common, Surrey (Wilson Saunders, 1871); Felden, in Herts (Piffard); Faversham, in Kent (Chitty); Lichfield, in Stafford, 1917 (Lance Carr); Selby, in Yorks (W. J. Fordham); apparently very rare in Notts, whence Prof. J. W. Carr has sent me but one female, taken at Bulwell Hall on August 17th, 1917.

7. PROCTOTRYPES DEVAGATOR, Oliv.

Ichneumon devagator, Oliv., Encycl. Méth., vii, 1792, p. 192. *I. campanulator*, Fab., Ent. Syst. Suppl., 1798, p. 227; Piez., p. 99. *Proctotrupes campanulator*, Klug., Mag. Ges. Nat., i, p. 73; Voll.,

l.c., p. 29, pl. xviii, fig. 4, ♀. *Eriodorus bimaculatus*, Walck., Faun. Paris, ii, 1802, p. 47. *Codrus campanulator*, Nees, *l.c.*, p. 353, excl. ♂. *Serphus divagator* (*sic*), André, *l.c.*, p. 292. ♀.

Modern authors have seen fit to regard this female as distinct from *P. gladiator*; personally I am convinced that it is no more than a brachypterous form thereof, for the entire structure is identical throughout. Chitty fully concurred in this opinion.

Italy, Hungary, Germany and France (Kieffer); it has recently been bred in some numbers in southern Europe from galls of the Dipteron, *Lonchaea lasiophthalma*, on *Dactylon*; Vollenhoven, however, records it from the fungus-gnat, *Sciophila lim.*, none of which are British; it is said to occur in September, sometimes under stones on the ground. Unknown to Haliday, and Westwood's 1840 figure obviously refers to *P. gladiator*; apparently hitherto not found in Britain, and erroneously recorded hence. I am glad to be able to definitely reinstate this name in our fauna by the capture of a typical specimen running on the bare sand during the afternoon of July 26th, 1904, on Foxhall Plateau, near Ipswich, in Suffolk.

8. PROCTOTRYPTES GLADIATOR, Hal.

Proctotrupes gladiator, Hal., *l.c.*, p. 10, ♀. Vollenh., *l.c.*, p. 30, fig. 7, ♀. *P. bicolor*, Hal. *l.c.*, ♂. *P. brevipennis*, Westwood, Introd., ii, 1840, p. 169, fig. lxxviii, ♀. *Serphus gladiator*, André, *l.c.*, p. 294, ♂ ♀.

Very rare in northern Ireland. Haliday took a female running among grass roots on a sunny sandy cliff; near Dublin (R. Ball); southern France (Walker); Sweden, Switzerland, Russia, Hungary (Kieffer). In my experience it is less frequent than *P. gravidator*, but not rare by sweeping short herbage in the most arid and sandy places, though not confined thereto; sometimes on flowers of *Compositæ*, and by beating bushes in woods. It has occurred to me only during September at Ipswich, in 1897; Depden, Frostenden, Covehithe Broad on *Tanacetum vulgare* and *Senecio Jacobæa*, and Baylham, except once, when a male was swept as early as June 22nd at Brandon. These Suffolk dates are connected by two other males found at Devonport during July (*P. de la Garde*) and Southampton on July 25th (*H. S. Gorham*); it has also occurred at Felden, in Herts (*Piffard*), and during 1900 at Westleton, in Suffolk (*Elliott*).

NOTES AND OBSERVATIONS.

VANESSA ANTIOPA IN GLOUCESTERSHIRE.—On September 12th, 1921, a specimen of *Vanessa antiopa* was captured near Speech House, Forest of Dean, Gloucestershire, by Mr. Heslop, of 34, Henleaze Gardens, Durdham Down, Bristol, which was afterwards shown to me.—GEO. C. GRIFFITHS; Penhurst, 3, Leigh Road, Clifton, Bristol.

HYDROECIA MICACEA f. BRUNNEA AT SEAFORD.—I should like to report the occurrence of *H. micacea* var. *brunnea*, Tutt, at Seaford last August. I should be interested to learn if this form has occurred in Sussex before. In general appearance it is very similar to *H. petasitis*.—B. H. ARMSTRONG; 7, Sandford Road, Bromley, Kent.

UNUSUAL OCCURRENCE OF PIERIS RAPÆ.—On March 1st a newly emerged *Pieris rapæ* was brought to me, having been taken in the Head Office of the London County and Westminster Bank, Lothbury. It was a cold day, and the nearest square where the larvæ could obtain food is, I think, Finsbury.—STANLEY A. BLENKARN; Burford Lodge, Boxhill, Dorking.

EARLY OCCURRENCE OF SMERINTHUS POPULI, ETC.—This morning a ♀ of *S. populi* was brought to me which had been taken at light in a barrack-room near Shooter's Hill some time during the last week of January. It was in fairly good condition and had deposited a few eggs which had proved fertile, but the young larvæ had died. On February 28th of this year Mr. M. Gaitskell, of Denstone College, took a specimen of *C. quadripunctata*, also at light.—GUY STANTON; Devon Lodge, Green Lane, Eltham, S.E. 9, April 16th, 1922.

LYCÆNA ASTRARCHE VARS. IN NORTH LANCASHIRE.—On July 23rd, 1917, I took a fine specimen of *L. astrarche* with the full complement of spots on upper side of wings pale canary yellow in colour, in place of the usual reddish-orange spots. The spots are large and well developed. This is referable to var. *pallidior*, Obth. On July 2nd, 1921, I was fortunate in capturing a specimen with the spots white, exactly the colour of the fringes of this species. It is also in first-class condition, but does not contain the full complement of spots. On the fore wings there are only three spots near the inner angle, and five better developed on the hind wings. This is referable to var. *graafii*, ver Huell. According to Tutt's 'British Butterflies,' vol. ii, p. 256, *pallidior* does not appear to have been previously recorded in the British Isles. He states that there is a specimen in the British Museum Collection taken in Norway, July 15th, 1887, from the Elwes Collection. With reference to *graafii*, the previous three or four specimens have all been taken in Holland, and this also appears to be new to Britain (v. Tutt, l. c.). On July 3rd, 1921, I took a variety of underside. The fore wings have four spots in the series and the usual spot in end of cell, but in the hind wings there is only the white discal spot, and another spot near the upper margin present, the usual row being entirely absent. On July 7th, 1921, another was taken with the fore wings containing the spot in cell well developed, but in the usual series only two very small spots present. On the hind wings only the white discal spot, the spot near upper margin, and the upper spot in usual series, are visible. The

butterfly is fairly common in North Lancashire, and vars. *allous*, Hb., *semiclaus*, Harrison, and *albimaculata*, Harrison, are of frequent occurrence. The pathological specimen, taken on July 21st, 1906, mentioned in Tutt, vol. ii, p. 231, which has the right hind wing of a silvery colour as in *H. phlaeas* ab. *schmidtii*, but with the orange-reddish spots normal, was kindly sent to me many years ago by Mr. Harrison, and is in my collection along with all those mentioned above.—ALBERT E. WRIGHT: Brunleigh, Grange-over-Sands.

ACROBASISTUMIDANA, SCHIFF = VERRUCELLA, Hb., = RUBROTHIELLA, F.R., at DARENTH.—In the catalogue of the second portion of the Farn Collection I noticed that there was included in Lot 433 five examples purporting to be this extremely rare British species, and for their sakes I acquired the lot. A close examination, before the sale, of course, convinced me that they were actually *A. tumidana*. The history of this species as British is one of the most remarkable of any of our Lepidoptera. It was first taken by R. McLachlan, in 1858, at Forest Hill, on the outskirts of London, apparently in some numbers. Odd specimens have since been taken at wide intervals in Hants, Dorset, and Suffolk. The Farn specimens are labelled in Farn's own writing "Darenth"; they bear the dates August, 1873 (1), and August, 1875 (4). They are mounted on the ordinary gilt pins, and judging by the setting, were probably taken by Farn himself. At this date his labels, at any rate amongst the *Phycids*, did not state the name of the captor. It seems rather remarkable that these specimens were never recorded: but then Farn hardly ever recorded any of his captures, and one supposes, too, that the too well known and frequented locality from which they came—Darenth—prevented him, for reasons of strategy, from disclosing their origin, or even the fact that he possessed them.—W. G. SHELDON: April 12th, 1922.

BUTTERFLIES ATTRACTED BY HUMAN PERSPIRATION.—The small collection of Lepidoptera enumerated below was received some months ago from my brother-in-law, Mr. Frank B. Hinchliff, who had recently obtained them while on a fishing expedition in Paraguay and Misiones in company with his cousin, Mr. Theodore Hubbard. He had no net nor any collecting apparatus with him, and his account of the means by which the butterflies were captured is so unusual I feel it should not be left unrecorded. He writes: "I have just returned from a six weeks' trip to Paraguay and Misiones, where I stayed at T—'s estancia—a very interesting trip indeed. . . . Butterflies were not in hundreds, but in thousands. It was a sight to see poor T— trying to fish with swarms of 'Purple Emperor'-like butterflies and others settling on his face and hands like mosquitoes—he counted nine different varieties at one time on his rod alone, and his face was covered with them, lapping up the perspiration that flowed down his cheeks. 'Swallow-tails' of all sorts and sizes simply swarmed. Some I failed to get, having no net, but I caught others by hand off my rod and face." With regard to this curious attraction that human perspiration seems to have for butterflies, I may mention that I have had many opportunities of collecting in the tropics, in both hemispheres, yet such an experience never happened to me, although I

was usually in a most profuse perspiration, with scores of butterflies around me; nor have I ever read or heard of anything like it. In reply to my brother-in-law's letter I wrote and told him how interesting his account was, and begged him to try and send me further particulars. His answer reached me a short time ago, so that I am able to add a few more notes: "The 'Purple Emperors' (*Apatura laurentia*, Godt.) were not sitting on me in ones or twos, but at one time I must have had a dozen, and they were so tame that we had what we called a 'pet' one. Several times we caught it between our fingers and thumbs and threw it up into the air, but it always came back. . . . They were a perfect nuisance to one—they alighted all over one's face and hands and arms, and sucked up our perspiration. They seemed to prefer T's to mine, though they were at times like mosquitoes buzzing and settling on me, and kept me busy brushing and waving them off. I found that the butterflies were also attracted by the 'droppings' of tapir, or 'carpincho,' in a clearance of the forest, and were swarming over the dirt." In a later letter my brother-in-law writes, in reply to queries from me: "As regards scent, sometimes we rubbed 'citronella' on our hands and necks as an anti-midge protection. It is supposed to keep insects away, but I do not think it attracted the butterflies, as they settled on face and clothes as well." I am indebted to Mr. N. D. Riley, of the British Museum (Nat. Hist.), for kindly giving me the names of the insects. Of course it was only the butterflies that were attracted in the way described; the moths were obtained otherwise. Danainæ: *Ituna ilione*, Cram. Satyrinæ: *Euptychia hermes*, Fabr.; *Pedaliodes phanias*, Hew. Brassolinæ: *Opsiphanes invirae*, Hübn. Nymphaliniæ: *Coloenis julia*, Fabr.; *Hypanartia lethe*, Fabr.; *Dynamine tithia*, Hübn.; *Catagramma candrena*, Godt., and *C. pygas*, Godt.; *Marpesia neleus*, Sulz.; *Siproeta trayja*, Hübn.; *Adelpha cytherea aca*, Frühst.; *Apatura laurentia*, Godt.; *Anaea memphis*, Feld. Pierinæ: *Pieris mandela*, Feld. Papilioninæ: *Papilio anchiades*, Esp.; *Papilio torquatus*, Cram. Syntomidæ: *Eurota picta*, H.S. Saturnidæ: *Hyperchiria*, sp. Geometridæ: *Heterusia quadriplicaria*, Hübn.—G. F. MATHEW; Dovercourt, Essex.

THE FARN COLLECTION: SECOND AND THIRD DAYS' SALE.—The sales of the remaining portions of this well-known collection, which were held at Stevens's Rooms on March 14th and April 4th, were again well attended, and although it was sometimes difficult to place long series of some of the commoner species even at five or six shillings, anything "at all out of the ordinary" easily found buyers, and often at very good prices. Included in the two days' sales there were twenty-six specimens of *Chrysophanus dispar*, of which the best easily made £10 to £13, grading down to £5 or £6 for those having less satisfactory condition and data, while an exceptional specimen with golden margins ran up to £17 10s.; one pupa skin was sold for 6s., but another failed to find a buyer. Nice series of about fifty *Coenonympha typhon* (*davus*) made £2 2s. to £4; a lot of fifty *Erebia aethiops* (*blandina*), including two or three aberrational forms, 55s.; one of eighteen *Strymon pruni*, including a broadly-banded form, 42s.:

* Several cases are on record. See 'Proc. Ent. Soc. London.'—Ed.

and an "hermaphrodite" *Bithys quercus* 30s. *Chrysophanus phlaeus* was well represented; silvery forms sold for 21s. to 88s. apiece, a pale golden for 84s., a lot of two bright golden for 70s., a remarkable form with a broad band of large blotches across centre of fore wings £9, and an "hermaphrodite" in a lot of twelve for 35s. the lot. A lot of three *Celastrina argolus*, which included a very pale and a very dusky male, made 90s.: one of fifty-six *Plebeus aegon*, including a pale lilac male and other remarkable specimens, 55s.: a well-marked "hermaphrodite" £5 10s.; and a very pale, broadly-streaked underside of *Aricia medon* (*astrarche*) £9. There was one *Lampides bacticus* in the collection, "taken near Dartford, by C. E. Sabine, 7 Sept., 1893," but even so the £9 paid for it seemed to be a good price. A smoky black male *Polyommatus icarus* sold for £9, a greenish-blue male 40s., one "left-side male, right-side female also 40s., a pale strongly-striped underside £7, and another, more strongly marked, with some other aberrations, £10 10s., while a nice series, including some well-marked Irish forms, made 55s. An asymmetrical *Agriades coridon*, in which the left fore wing was practically black, with narrow blue stripes, brought £5 10s., and a grey-brown radiated underside £9; a lot of eight v. *fourieri* £3 5s., and one containing two underside v. *obsoleta* and one radiated 50s. An ochreous-grey male *A. bellargus* and one black-dusted with broad margins in a lot of fourteen made £6 10s. the lot; four "black" forms sold separately at £8 10s. for the best, and 40s., 30s. and 16s. each for the others; and one of the most beautiful and perfect radiated male undersides we remember to have seen ran up to £20. There were three lots of twelve each of the "blues" taken by Sabine near Rainham in 1886 and said to be hybrids between *P. icarus* and *A. bellargus*, and they sold for £20, £5 and £3 per lot respectively. *Lycæna arion* in lots of about twenty made £4 per lot for those from Barnwell Wold and Gloucestershire, and from 35s. to 52s. 6d. for the Cornish, while an almost spotless specimen with an asymmetrical underside put up in one lot brought £8, and a beautiful dark aberration of *Carterocephalus palaemon* £5. The Heterocera were "by comparison less interesting and had apparently not been so well kept up to date as the Rhopalocera, but there were many nice things among them and they found ready buyers. *Phryxus licornica* bred from larva taken at Ryde with its pupa skin made 20s., *Utetheisa pulchella* 30s., while couples of the same species in lots with other species brought 75s., 20s. and 16s. per lot. A black *Callimorpha dominula* sold for 55s., a nice light form of *Arctia caja* for £5 10s., and an almost unicolorous brown one for £5. *Laelia coenosa* was not in demand, the best two selling for 20s., four others for 18s., and five with four preserved larvæ for 14s. An "hermaphrodite" *Poecilocampa populi* made 20s., a smoky form of *Lasiocampa quercus* (with other species) £3, and a "hermaphrodite" *L. quercus* £6. Lots of six *Nola centonalis* with eight *N. albulalis* brought 25s. to 30s. per lot, a lot in which was included a fine black-streaked *Senta irrorella* 65s., and *Drepana harpagula* (*sicula*) in pairs 20s. and 35s. per pair. The one *Notodonta bicolor* in the collection ran up to £4 15s.; it was labelled "Burnt Wood, Staffs, Chapple." *Aeronycta strigosa* sold at 25s., 45s. and 32s. 6d. per lot of ten, *Crymodes exilis* from Shetland at 18s., 18s., 45s. and 21s. per lot of

three, and from Rannoch at 65s. per lot of two for the two lots offered. A fine male *Hydrilla palustris*, of Farn's own taking, made 55s. *Noctua subrosea* ranged from 21s. to 63s. each, and *Cerastis erythrocephala* from 7s. to 12s. per couple, while an aberration of *Euclidia glyphica* having the outer third of its wings buff colour made £3 10s. *Catocala fraxini* in couples sold for 21s. and 28s., and *Dianthea baretii* and *D. albimacula* put up in lots containing twelve of each species 32s. 6d. and 28s. per lot. *Xylina furcifera* (*conformis*) in lots of four made 32s. 6d. to 45s. per lot, a lot of six *X. conformis* and one *X. lambda* (*zinkenii*) 60s., and two other lots in each of which one *X. lambda* was included 80s. and 55s. respectively. A lot of sixty-four insects in which one each of *Thalpocharis ostrina* and *T. parva* were included ran up to £4, while another lot which contained among its eighteen *Venilia macularia* one almost spotless and four heavily-blotched forms realised the like amount. Two *Boletobia fuliginaria* sold as one lot made 30s., and three *Cleora angularia* (*viduaria*) 60s. the lot. A sporting lot of six insects, viz. two *Aplasta ononaria*, three *Lythria purpuraria* and one Sp. ? sold for 42s., and another consisting of three *L. purpuraria* and three *Sterrhia sacraria* 35s., while two lots of three *S. sacraria* each made 35s. and 37s. 6d. per lot respectively. The collection was not strong in remarkable forms of *Abraras grossulariata*, and the highest price paid for any one lot of the species was 45s. for one of ten specimens. Long and varied series of *Melanippe montanata* made 50s., of *Cidaria truncata* (*russata*) 55s., and *C. immanata* 50s. and 40s., while two specimens of *C. prunata*, "suffused forms with cream bands," ran up to 70s. The "Micros" also sold fairly well, quite a number of lots realising between one and two pounds each. The cabinets that contained the collection were all well made and in thoroughly good condition, with drawers 20 x 18 inches, and the prices at which they sold were for those with 36 drawers £59 17s., £50, and £73 10s.; for the two 18-drawer pedestals £28 and £25 4s.; for the 12-drawer pedestal £14; and for a 20-drawer pedestal with 18 x 16-inch drawers £22. Among four lots of books that were included in the sale, one consisting of Newman's 'British Moths' interleaved with notes by Farn and 'Stainton's Manual' sold for 20s., and another of 14 parts of Mosley's 'Illustrations of Varieties of British Lepidoptera' £8. The total realised for the whole collection, cabinets and books was, in round figures, £2100.—R. A.

A NEW METHOD OF PRESERVING SPECIMENS.—We understand that "Thymo-Plas," a specially prepared plasticine compound for the preservation of specimens in small handy cells, has now been put on the market together with the necessary accessories by Messrs. Harbutt's Plasticine, Ltd. The method is the invention of Dr. Alfred Moore, and has been adopted by the Entomological Department of the Royal College of Science. It is claimed that by this method specimens can be kept in a fresh condition for very long periods.

'ZOOLOGICAL RECORD.'—Since 1914 the whole cost of printing and publishing this invaluable annual summary of zoological literature has been borne by the Zoological Society of London. Owing to the

present high prices of printing, etc., the sum which has to be found annually is now between £1500 and £2000, and it is very much feared that unless a more cordial support is forthcoming from zoological workers in general it may be necessary to cease publication in the near future. The annual subscription for the complete volume is £2 10s.; for the *Insecta* 15s. It is most earnestly to be hoped that the publication may not cease from lack of support on the part of entomologists.

WICKEN FEN FUND.—This fund is raised annually by entomologists to assist in defraying the expenses incurred by the Custodian of Wicken Fen, the National Trust, in administering and preserving the Fen, and in providing a watcher to protect the plants and wild life dwelling therein. Contributions are earnestly solicited; they should be sent to the Hon. Treasurer, W. G. Sheldon, Youlgreave, South Croydon.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 1st, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—The following were elected Fellows of the Society: Mrs. Margaret Rae, Courthill, Birkenhead; Dr. A. F. Rosa, M.D., 28, Pitt Street, Edinburgh; Mr. Frank Russell, F.G.S., Auldham House, Worksop; and Capt. Francis Moysey, Suffolk Regiment, Talodi, Nuba Mountains, Sudan.—The Treasurer made a statement on the Wicken Fen Fund. He called attention to the valuable work that is being done on this Nature reserve and made an appeal for contributions towards its maintenance.—The Treasurer announced that the late Mr. G. A. J. Roddrey had bequeathed the sum of £150 to the Society.—The President announced the death of Prof. Geldart, and a vote of condolence with his relatives was passed.—Dr. Waterston exhibited a Brazilian bee, *Melipona scutellaris*, Latr., taken near Brighton, also a stem of *Arundo phragmites* from which numerous pupae of a Chalcid, *Geomacrus flavimanus*, Thoms., were projecting.—Mr. H. Mace, a number of butterflies from the neighbourhood of Khartoum.—Mr. Adkin, *Daphnia mendica* var. *venosa*, Adk., from Co. Tyrone, and compared it with other races of the species.—Mr. E. B. Ashby, numerous insects of various orders from Piedmont, Italy.—Prof. E. B. Poultou reads some notes on the utilisation of derived plant pigments in the colouring of Lepidoptera: he also read a communication from the late Dr. T. A. Chapman on germinal "factors" and their independent existence and development.—Mr. Hugh Main read some notes on the metamorphoses of *Onthophagus lauras*, L., illustrated with some remarkable lantern-slides.—The following papers were read: "Gynandromorphous *Plebejus argus*, L.," by Dr. E. A. Cockayne; "Butterflies from the Nile," by Mr. H. Mace; "Types of Oriental Carabidae in the Stettin Museum," by Mr. H. E. Andrewes; and "New Genera and Species of Neotropical Cixiulonidae," by Dr. G. A. K. Marshall.—S. A. NEAVE, Secretary.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*Annual Meeting, January 26th, 1922.*—Mr. Stanley Edwards, F.L.S., Vice-President,

in the Chair.—The Report of the Council, Statement of the Treasurer and Balance Sheet were received and adopted. The following members were declared elected Officers and Council for the ensuing year :—President: E. J. Bunnett, M.A., F.E.S. Vice-Presidents: K. G. Blair, B.Sc., F.E.S., and N. D. Riley, F.E.S., F.Z.S. Treasurer: A. E. Tonge, F.E.S. Librarian: A. W. Dods. Curator: S. R. Ashby, F.E.S. Assistant Curator: T. L. Barnett. Editor of Proceedings: Hy. J. Turner, F.E.S. Hon. Secretaries: Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S. Recorder: L. E. Dunster. Lanternist: A. W. Dennis. Council: T. L. Barnett, A. A. W. Buckstone, L. E. Dunster, O. R. Goodman, F.E.S., T. H. L. Grosvenor, F.E.S., H. A. Leeds, G. S. Robertson, M.D., E. Step, F.L.S., and S. Syms.—The President being unwell, his Annual Address was read by Mr. Riley. It was entitled "Will o' the Wisp," and dealt historically and biologically with fireflies.—The new President, Mr. E. J. Bunnett, then took the Chair, and votes of thanks were passed to the retiring Officers and Council. Major C. E. Lyles, 6, Hyde Park Mansions, and Mr. J. H. Adkin, Whitecliff Road, Purley, were elected members.—Mr. C. Craufurd exhibited an *Aglais urticae* with a curious deficiency of colour in two streaks on the hind margin of the hind wings; the scaling was perfect.

February 9th.—The President in the Chair.—Miss Alice K. Lock, 77, Grove Hill Road, S.E., was elected a member.—Mr. R. Adkin exhibited a second brood series of *Brenthis selene* from Abbot's Wood, Sussex, at end of July and in August.—Mr. A. A. W. Buckstone, a large form of the same species racial in the Isle of Arran, and a series of a small race from Headly; and an aberrant form of *Taeniocampa incerta*, resembling both *T. munda* and *T. gracilis*.—Mr. H. W. Andrews, the Anthomyidae (Dip.), *Hylophila sponsa*, said to be rare, but common in Kent, and species of local *Limnophora*.—Mr. H. Moore, a large species of *Galeodes* from Cape Town, usually placed between the spiders and the mites; it attacks small birds, lizards, etc., and is venomous.—Mr. Blenkarn, *Cryptocephalus coryli* from Mickleham, with a spot on each elytra, and the racial form of *Philodecta laticollis* from Killarney, December, 1921.—Mr. H. J. Turner, for Mr. Greer of Stewartstown, aberrations of butterflies, *Euchloë cardamines*, ♂ ab. *marginata*, ♂ orange streaked with black, ♂ small, ♀ large, ♀ ab. *radiata*, ♀ orange streaks on fore wing; *Melitaea aurinia*, ♀ dull and obscure; *Pararge megera*, ♂, apical blotch reduced to a dot, apical spot duplicated; *Polyommatus icarus*, ♂, faint red marginal spots on hind wing above and below, ab. *icarinus*, ♂ ♀ gynandromorph, ♀ with red spots in margin forming a band.—Mr. Frohawk, *Aglais urticae*, suffused very considerably; *Pieris napi* ♂, asymmetrical central wing spot, R. almost missing, L. unusually large; *Argynnis paphia*, ♂, central markings much suffused; *Euchloë cardamines*, ♂ and ♀, with discal spots in hind wings; *P. brassicae*, a series of *nigronotata* with well-developed discal spot: also a fine pencil sketch of a hybrid pheasant and grouse.—Mr. Enefer, *Curcuta epithymum*, the dodder of the gorse, an anastomose specimen of oak, and a section of the mistletoe on apple.—H. J. TURNER, Hon. Sec.

LONDON NATURAL HISTORY SOCIETY.—November 22nd, 1921.—Among the entomological exhibits were seven specimens of *Cirapta c-album* bred from pupæ found in September in Herefordshire, showing both "marbled" and "non-marbled" forms, exhibited by Mr. Robbins, and some *Euvanessa antiopa* with white borders caught in August and September in fresh condition by Dr. Cockayne. The paper read was on "Bird Protection," by Mr. Masefield.

January 3rd, 1922.—Mr. Mera exhibited *Ephyra leucaria*, first and second broods, and Mr. Burkill, galls of *Cryptocampus medullarius* on *Salix pentandra*. Papers read dealt with the season of 1921, Mr. L. W. Newman giving a comprehensive survey of his experiences with Lepidoptera during the long drought.

February 7th.—Among the exhibits were a series of gynandromorphs of *Plebeius argus* (Dr. Cockayne), varieties of *Abraxas grossulariata* bred in London (Mr. Riche's), *Dryas paphia* (Mr. H. B. Williams), *Hemerophila abruptaria* (Mr. W. A. Southey), *Erebia blanda*, *Chrysophanus phloas*, *Graphos partienias* and *Pseudoterpnia pruinata* and their varieties (Mr. Worsley Wood), and mounted specimens of plant galls (Messrs. Hall and Burkill). Mr. O. G. Pike exhibited a series of coloured slides of birds.

February 21st.—Paper read, "British Ferns," by Mr. Robbins.

March 7th.—Exhibits: Burrow of *Sesia andreaeformis*, and galls of *Eriophyes ilicis*, etc. Paper read, "The Buried Palace at Knossos," by Rev. H. J. Gamble, M.A.—H. J. BURKILL, *Minuting Secretary*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held on March 1st, 1922, at the Manchester Museum, Mr. H. Britten, F.E.S., President, in the Chair. Messrs. Daniel Lea, 27, Bridge Street, Manchester, E. P. Collett, 8, St. John Street, Manchester, were elected members of the Society.—The President read a letter announcing the death of Mr. Kenneth Rhodes at Oxford on February 16th, 1922, and a vote of condolence was passed to his relatives.—Exhibits: Mr. W. Buckley, for Mr. W. Mansbridge, several fine photographs illustrating the resting habits of Lepidoptera, taken by Mr. H. Main.—Mr. H. Halkyard, a storebox of Hymenoptera collected during 1921 from Broadbottom, Cheshire, and ♂♂ and ♀♀ of the ant *Tetramorium guineense* from same locality. Mr. B. H. Crabtree, several fine varieties of *Vanessa urticae*.—Mr. G. Wynne, *Eunychia octomaculata* from Macclesfield, new to the Cheshire list. Lepidoptera from St. Anne's-on-Sea, Lancashire, 1921: *Luperina quenei*, *Agrotis praeceps*, *A. ripae*, *Leucania litteralis*, *Eupithecia succenturiata*, *E. oblongata*, *Nyssia zonaria*, *Dasychira fasciata*, *Pararge megera*, *Satyrus semele*. The meeting then adjourned to an open lecture given by Mr. H. Britten, F.E.S., on "Protective Coloration in Insects," illustrated by some fine lantern-slides showing the resting habits and protective coloration of insects, mostly Lepidoptera, and a few birds. Most of the slides were photographed by the lecturer himself.—J. F. G. WYNNE, *Hon. Recording Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, January 16th, 1922.—Mr. J. W. Griffin, F.E.S., in the Chair.—Mr. H. O. Wells,

"Inchiquin," Lynwood Avenue, Epsom, was elected a member of the Society.—Mr. Wm. Mansbridge reported favourable progress of the Joint Committee of Scientific Societies in Liverpool towards arranging an Associated Soiree, and the general closer co-operation of the scientific societies in the district.—Mr. Mansbridge then read his report as Recorder of Lepidoptera for the years 1920 and 1921. He mentioned that, besides many interesting records, five species had been added to the Lancashire and Cheshire list in 1920 and five in 1921. These included one species new to Britain, viz. *Blastobasis lignea*, Wlsm., and its variety *adustella*, Wlsm. Most of the additions had been made by the members who study Micro-lepidoptera, and this was considered to be a very encouraging feature of the Society's work.—Mr. H. B. Prince exhibited a box of insects which he had bred from a number of larvæ caught in paper traps at Hightown; they included *A. triangulum*, *A. ditrapezium*, *P. fuliginosa*, *L. lithargyrea*, *T. gothica*, *T. baja* and *A. comes*. This is the first record of *ditrapezium* in Lancashire.—CHARLES P. RIMMER, *Hon. Sec.*

CARLISLE NATURAL HISTORY SOCIETY.—November 17th, 1921.—Mr. G. B. Routledge showed a specimen of the ground beetle *Pterostichus vulgaris* from which a long intestinal worm was protruding.—Rev. H. D. Ford, a pale example of *Brenthis selene*, a curiously bleached *Coenonympha typhon*, a dwarf *Zephyrus quercus*, *Erebia epiphron* with white pupillation, *Agrotis exclamationis* with enlarged markings and *Selenia bilunaria* with the left hind wing missing.—Mr. F. H. Day, a dwarf ♂ *Pararge megaera* from Cummersdale, *Porthesia similis* from Drigg and not taken in Cumberland for a very long time, *Epinephele tithonus* from South Cumberland, where it had been very common last July; in the north of the county it was unknown. Some discussion took place on the early appearance of butterflies in 1921, most of the species having been two to three weeks before their usual time; thus *Callophrys rubi* had been "out" at the end of April, *Euchloë cardamines* and *Pararge megaera* early in May, *Coenonympha typhon* on June 4th and *Argynnis aglaia* on June 18th.—Mr. Murray, *Hemiptera* taken locally, including *Strongylocoris luridus*, the first to be taken in Cumberland and extremely rare in Britain, *Bothynotus pilosus* and *Ploiariola culiciformis*.

December 1st.—Dr. Day showed a long variable series of *Satyrus semele* from the Cumberland coast where it had been commoner than usual in 1921, also vars. of *Chrysophanus phlaeas* from the second brood which were remarkably dull in colour.

January 5th, 1922.—The extreme abundance of *Pyrameis atalanta* in 1921 was discussed, the general view being that it had never been observed in such large numbers in the district before. *P. cardui* had been fairly well represented. Among a number of *P. atalanta* exhibited was one with the left primary aborted, the colours pale, the scarlet band broken, but entire on the right side.—Mr. Murray, the large Dipteron *Tabanus sudeticus*, and it was remarked that the allied *T. bovinus* had not been taken in Cumberland.

February 2nd.—Mr. Day showed about 70 specimens of *Bombus* and *Psithyrus* taken in Cumberland last season, and said that

14 species of the former genus and 4 of the latter had now been captured in the county.—Mr. Murray, a box of Cayenne pepper in which the beetle *Anobium paniceum* was breeding.

March 3rd.—An exhibit of locally-taken forms of the common froghopper *Philaenus spumarius* was made by Messrs. Murray and Day, the following being represented: *lateralis*, L., *populi*, F., *lineata*, F., *vittata*, F., *leucophthalma*, L., *leucocephala*, L., and *marginellus*, F. Mr. Day showed the following Coleoptera which had not occurred in Cumberland before: *Meligethes erilis* from Drigg, *Pityogenes chalcographus*, *Dryocetes autographus* and *Tomicus typographus*, the three latter taken under bark of spruce in Carlisle.—F. H. DAY, Hon. Sec.

OBITUARY.

GILBERT STOREY was already a keen naturalist when at school at King William's College, Isle of Man. He went to Queens' College, Cambridge, in 1909, and there spent much of his spare time collecting Lepidoptera in the neighbouring fens.

On leaving Cambridge in 1912 he obtained a temporary appointment in the Imperial Bureau of Entomology, but three months later he went out to join the Entomological Section of the Ministry of Agriculture of Egypt. His work there was largely administrative, but he was closely associated with Dr. L. D. Gough in the development of the seed-heating method of destroying the Pink Boll-worm of cotton. Later he was appointed Sub-Director of the Entomological Section.

In 1920 his exceptional abilities caused him to be offered the post of Technical Secretary to the Cotton Research Board—a recently formed organisation for research on problems of cotton cultivation in Egypt. After piloting through the press the first annual report of this Board, he was engaged on the second report when he was taken ill, but finished the report in bed a few days before his death on April 5th, 1922.

In addition to being an excellent entomologist, he was a first-class athlete, and possessed a fluent knowledge of Arabic.

His death at the early age of thirty-one is mourned in Egypt by Europeans and Egyptians alike.

C. B. W.

WE deeply regret to hear of the death of Mr. Arthur Bacot at Cairo on Wednesday, April 12th, from typhus.

1209



H. ROWLAND-BROWN.

THE ENTOMOLOGIST.

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[No. 709

HENRY ROWLAND-BROWN.

(Plate I.)*

It is with the deepest regret that we have to record the death of one of the best known and most popular of British entomologists, a member of our Editorial Staff, and one whose writings are known and appreciated by all our readers.

Although past his first youth Mr. Rowland-Brown was of such strong physique, and had enjoyed such perfect health until recently, that so far as could be seen there were many years of life before him. About a year ago, however, he developed a heart affection, which it is thought originated early in life through athleticism, and which there is not much doubt was hastened by his strenuous war work. Although apparently hopelessly ill last summer, his splendid constitution enabled him to make a wonderful rally, and it was hoped he might be restored to partial health and comfort, but it was not to be, and he passed away at his residence, Oxhey Grove, Harrow Weald, on May 3rd last.

Henry Rowland-Brown was born at Woodridings, Pinner, on May 19th, 1865, and would thus be in his fifty-seventh year at the time of his death. He was educated at Rugby, being during a portion of his schooldays under the care of the well-known hymenopterist, the Rev. F. D. Morice. At school he was a noted athlete, and winner of the record quarter-mile. After leaving Rugby he proceeded to Oxford (University College), where he took his degree of Master of Arts. After leaving Oxford, he, a member of an old legal family, studied for the Bar, to which he was called in due course.

He was a man of many parts: journalism and other literary pursuits occupied much of his working time, and he frequently contributed to the *Times*, and to the 'Strand,' 'Cornhill,' and other magazines. But he was also a poet of no mean powers, and his two volumes, 'Rhymes and Rhapsodies' and 'Preludes and Symphonies,' betray true poetic genius. He usually wrote under the *nom-de-plume* of "Oliver Grey," a name associated with that of his sister, Miss Rowland-Brown, the novelist, whose name and writings as "Rowland Grey" have attained world-wide fame.

Amongst his troops of friends he numbered as intimate ones

* We are greatly indebted to M. Charles Oberthür for his express permission to reproduce this photograph from his 'Lépidoptérologie Comparée.'—Ed.

Sir William Gilbert (of Gilbert and Sullivan Opera fame), and M. Charles Oberthur, the greatest of French entomologists. During the war, as he was too old to join up, he gave voluntary assistance for a time as secretary to the Royal Patriotic Fund. Later he was appointed a Commissioner for Civil Liabilities, holding the largest single-handed district, Wandsworth and Battersea; as before intimated, this work, which was very arduous, overtaxed his constitution, and hastened his end.

Rowland-Brown was a Nature-lover and entomologist from his childhood; his great love was the Rhopalocera. The writer, who knew him intimately for many years, recollects the joy with which he spoke of chasing *Colias edusa* with his sister when they were young children. One of his last letters (dictated) to the Editor of this magazine recounts that he commenced to take it in when he was twelve years of age, and that he had continued to do so ever since. The last book he read was the 'Entomologist.' Readers will not need to be told that for years he has been its most prolific contributor, and that much of his most important work, with accounts of the many excursions he made in search of butterflies to various parts of Continental Europe, are to be found in its pages. His special study was the *Diurni* of France, with which he undoubtedly possessed a greater acquaintance than any other Englishman. He intended at one time to bring out a book on this subject, but the war put an end to the project, as well as to a revised edition of Kane's classic, 'European Butterflies,' at a period when they were well advanced. A number of his papers are included in M. Oberthur's beautiful publications, including 'Nature Study and the War,' which had appeared previously in the *Times*, and a monograph on the British races of *Coenonympha tiphon*. The latter paper, beautifully illustrated by Culot, and by a series of photographs, was thoroughly worked out, and is, in the opinion of the writer, one of the best papers on any British Lepidopteron. His last contribution to entomology, which appeared in this magazine, was a very exhaustive one on the forms of a very favourite species—*Colias croceus* (*edusa*).

The subject of this notice was essentially a lover of all Nature, and especially of what he used to style his "beloved butterflies." The writer's last visit was paid to him in October last; he had been able to get down to the library, amongst his cabinets, after months of pain and sickness. It was touching to see the glee with which he showed and discussed certain of his treasures.

It is understood that his collections, including those of the Rev. F. E. Lowe, recently bequeathed to him, and his entomological library will be given at his request to the London Entomological Society with remainder to the Hope Museum, Oxford. The latter has previously received a fine microscope left him by Sir W. S. Gilbert.

Rowland-Brown was one of the best-known Fellows of the Entomological Society, which he joined in 1887, and one of its most helpful friends. He was a regular attendant at its meetings. Beyond everything else he rendered it great service as Honorary Secretary from 1900 to 1910, and again in 1921, when the health of the Rev. G. Wheeler would not permit him to continue his duties, they were resumed by him. He was one of the best and most popular secretaries the Society ever had, was nominated a Vice-President in 1908 and 1910, and elected on the Council in 1914-16 and again in 1922. The writer remembers, too, the valuable assistance rendered by an excellent review of, and appeal for, the Society's Housing Fund, which appeared in this magazine early in 1921.

Before the war, when the Entomological Club, of which he was a member, was in full activity, his share of its hospitalities was delightfully dispensed at the Savage Club, and the writer remembers happy hours passed under those auspices; he was an excellent *raconteur*, and a most charming host, both there and at his own home.

He was laid at rest in the cemetery adjoining the old church at Pinner, amongst his happy hunting-grounds. Nature welcomed the return of her lover to her breast: the sun shone brightly; the warm southern wind blew softly; plant and shrub and tree were breaking into leaf, and the birds mingled their notes with the melody of the organ and the voices of the choristers. He will sleep soundly after long suffering, patiently and bravely borne. To his bereaved mother and sister we desire to tender our very deep and sincere sympathy.—W. G. S.

TWO NEW SPECIES OF FAR EASTERN RHOPALOCERA.

BY WARO NAKAHARA, A.M., PH.D.

Eurema dorothea, n. sp. (Pieridae).

Male.—Wings bright lemon yellow, sprinkled with black atoms in the basal one-third. Fore wing with straight outer margin, not angulated at apex; the black border broadest at apex, slightly narrower toward hind angle, and very narrow along costa; the inner portion of the black border evenly undulated, showing no marked indentation at the third and fourth interspaces as in *E. hecabe*, Boisdu., *E. latimargo*, Hoff., *E. andersoni*, Moore, etc.: the black border of hind wing nearly as broad as in *E. latimargo*, Hoff. Marginal fringes blackish in fore wing, yellow in hind wing. Underside: both wings with minute black dots along the margin and two dots near the end of discal cell; hind wing irregularly and slightly sprinkled with dark atoms. Head and thorax black above, pale yellow beneath; palpus yellow, with a delicate dorsal black streak; abdomen yellowish, with an intact dorsal, and broken lateral black stripes.

Length of body $\frac{5}{8}$ in.; expanse of wings $1\frac{3}{4}$ in.

Holotype: ♂, Horisha, Formosa, July 20th, 1919 (K. Asakura).
Type in the collection of the author.

Very close to *E. libythea*, Fab., but far larger in size, and lacks the orange border to the fore wing underside.

Zizera sylvia, n. sp. (Lycaenidae).

Male.—Wings, upperside, violet-blue, darker and less purplish than in *maha*; costal margin of fore wing without whitish scales, outer margin broadly bordered with black, with a trace of a short whitish streak at hind angle. Hind wing similarly marked, but the black border narrower, and with a row of four or five obscure black spots along outer margin. Fringes white. Underside grey, not buffish as in *maha*; fore wing with three rows of black spots along outer margin: internal row consists of five round spots, each encircled with white, and a less distinct bar at the bottom of the row; median (submarginal) row with six very much larger spots; external (marginal) row rudimental, disappearing toward hind angle; a prominent black bar at the end of discal cell; no black spots in the middle of discal cell, or near the base of the wing. Hind wing with five series of black spots: basal series with two or often three spots; costo-discal series three spots, including the bar at the end of discal cell; limbal series with six spots, extending from the first to sixth interspaces; submarginal series most conspicuous, consisting of eight very heavy spots; marginal series indistinct, often hardly recognisable: all the spots more or less distinctly encircled with white. Fringes white, regularly interrupted by grey.

Female.—Wings: upperside fuscous black with a trace of blue near the base; underside same as in the male.

Length of body $\frac{1}{2}$ to $\frac{3}{4}$ in.: expanse of wings $\frac{1}{2}$ to $\frac{3}{4}$ in.

Holotype: ♂, Kusakimura, Province of Harima, Japan, July 7th, 1920 (S. Iguchi). Allotopotype: ♀. Paratopotype: 2 ♂s and ♀. Types in the collection of the author.

Resembles the summer brood of *Z. maha*, Koll., but smaller, and has narrower wings. It can be most readily told from *maha* by the markings on the hind wing underside. In *maha* the black spot in the seventh interspace is so situated as to connect the spot in the eighth interspace to the limbal series (as in most *Lycaenas*), whereas in *sylvia* the corresponding spot is located right behind the spot of the eighth interspace, separating that spot from the limbal series (as in *Cyaniris argiolus*, L., etc.). In this respect this species is more like *Z. labradus*, Godt., from which, as well as from *maha*, differing conspicuously by the submarginal series of black spots on the underside being much heavier than the marginal series.

11, West Sixty-Eighth Street,
New York City;
February 5th, 1922.

NOTES ON BRITISH ODONATA IN 1921.

By W. J. LUCAS, B.A., F.E.S.

My first dragonfly experience for 1921 was the receipt of a very teneral male *Pyrrosoma nymphula*, Sulz., from G. T. Lyle, which he captured on 1 May at Wicken Fen. I did not myself meet with a dragonfly till 16 May, when *Ischnura elegans*, Vanderl., was found in large numbers—many mature, a smaller number teneral—along a ditch or drain at Lodmoor, Weymouth.

On 18 May I took in the New Forest a male *P. nymphula*, fairly mature but still with the thoracic markings yellow instead of crimson. The next day, in addition, I met with *Calopteryx virgo*, Linn., *Libellula depressa*, Linn., and *Gomphus vulgatissimus*, Linn., most, if not all, of which appeared to be teneral. On the 20th *Libellula quadrimaculata*, Linn., was captured in somewhat teneral condition and *Orthetrum caeruleum*, Fabr., decidedly in that state; *Agrion puella*, Linn., male, was, however, taken mature, and *P. nymphula*, which was by then common, was secured with crimson thoracic markings for the first time. On 21 May *Cordulegaster annulatus*, Latr., was met with, and by this time the dragonfly season may be said to have been in full swing.

Æschnidæ.

Gomphus vulgatissimus, Linn. Besides the one seen on 19 May, a pair were taken *in copula* on 7 June near Oberwater in the New Forest, and the species was seen again in the same locality on 9 June.

Cordulegaster annulatus, Latr., was first met with in the New Forest on 21 May, and last noticed in the same place between 31 Aug. and 20 Sept., when dragonflies, no doubt owing to the drought, were no longer common in the Forest.

Brachytron pratense, Müll. On 6 June two males were taken at Marlborough Deepes in the New Forest.

Aeschna grandis, Linn., was seen ovipositing in the Long Water at Hampton Court, Middlesex, on 19 August. At the Hut Ponds near Wisley, Surrey, it was seen on 22 Aug.

Ae. cyanea, Müll. On 5 Sept. a male was caught near Avonwater in the New Forest. While held by its wings a fly was offered it about the size of a house-fly—one of those that follow one so persistently in the summer. This it took readily and ate; but a second that was offered was refused. While its wings were held it was still able to set up vibrations in some way. Its head and surrounding parts were seen to be in motion, so it seemed clear that these vibrations were not due to movements originating in the wings. The last dragonfly seen during the season was an *Aeschna* (probably of this species), flying about a Scotch Fir at Oxshott Heath, Surrey, on 29 October.

Anax imperator, Leach. Several were noticed on 14 June at the Black Pond, Esher Common, Surrey, although dragonflies did not seem to be very numerous in the neighbourhood.

Libellulidæ.

Cordulia aenea, Linn. One male was taken at Marlborough Deep in the New Forest on 6 June, perhaps the only specimen seen. This capture is an interesting one, since the species is but little known and apparently quite uncommon in the Forest.

Libellula quadrimaculata, Linn., was fairly common on the same date and at the same place as the last.

Orthetrum caeruleum, Fabr. On 3 June there appeared to have recently been a great "hatch" of this species, for they were plentiful on that date in the Forest, though still teneral; but by 9 June some were acquiring a blue tint. This species seems to take some time to develop the cerulean bloom.

Sympetrum striolatum, Charp., appeared to be less common than usual, possibly in consequence of the drought. On 9 Oct., a warm day, considerable numbers of *Sympetrum*, no doubt all *S. striolatum*, were flying, some connected *per collum* and the female ovipositing, at the large pond on Epsom Common, Surrey. All the examples captured were of this species.

Sympetrum sanguineum, Mull. A female was taken at the Hut Ponds near Wisley, Surrey on 22nd August, and possibly the species was seen there as late as 25 Oct.

Sympetrum scoticum, Don., was noticed at the ponds just mentioned on 22 August.

Calopterygidæ.

Calopteryx virgo, Linn. After being first met with in the New Forest on 19 May, it was found to be common on the 22nd, though few comparatively had attained a blue tint to the wings; the same thing was noticed the next day. By 8 June, however, the wings were commonly blue and the insects made a fine show as they flitted about in the sunshine. On 22 July they were passing, only occasional specimens being seen. They disappeared earlier than usual, as was perhaps to be expected.

Lestidæ.

Lestes sponsa, Hans. This dragonfly was noticed but once—at the Hut Ponds on 22 August. It is really one of our common dragonflies, but the naiad seems to be rather elusive, and the writer would be glad to receive some, or their empty skins.

Agrionidæ.

Platynemis pennipes, Pall., was first seen on 4 June, in the New Forest, and the specimen happened to be the var. *lactea*, Charp.

Ischnura elegans, Vanderl., was not sought for. After finding

it on 16 May at Weymouth, I took a teneral example in the New Forest on 9 June, and noticed it again on 22 Aug., at the Hut Ponds.

Ischnura pumilio, Charp. I searched several times and at various places in the New Forest for this little dragonfly, but again failed to find it. It is to be feared that for some reason it has disappeared, at any rate for the time being. It probably lives in bogs, rather than in more open waters, and should be looked for in such places.

Agrion mercuriale, Charp. On 25 May two females were secured at Duck Hole Bog in the New Forest, and perhaps a male was seen, but a male was not captured till 3 June.

Agrion puella, Linn., was first taken on 20 May in the New Forest; it was common on 6 June at Marlborough Deep. On 18 July I took a male at Blackwater in the New Forest with a black dot within the U-spot on the 2nd segment of the abdomen; but aberrant black markings are not uncommon on the blue Agrions.

Pyrrhosoma nymphula, Sulz. This common dragonfly was not much noted after the middle of May. It was common at Marlborough Deep on 6 June.

Pyrrhosoma tenellum, Vill., was first seen in the New Forest on 3 June, when it seemed to be out plentifully. A female of the var. *melanogastrum*, Selys, was captured.

Enallagma cyathigerum, Charp. This very common little Agrionid was not particularly looked for. It was, however, taken on 1 July at two interesting localities in Middlesex—Stanmore Common and Elstree Reservoir. One specimen from the latter locality had on the 2nd segment a very goblet-shaped spot with but slight attachment to the circlet, while one from the former place had the spot quite detached. The species was met with commonly at the Hut Ponds on 22 August.

(To be continued.)

RAMBLES IN SOUTH-EASTERN FRANCE.

By F. A. OLDAKER, M.A., F.E.S.

The walking tour that I had planned for August, 1914, but which was rendered abortive by the outbreak of the Great War, was carried out by my son and myself in a somewhat extended form during August, 1920, and with other members of my family I paid another visit to the same district in August, 1921. Though entomology was not, I fear, the only object of interest to us on either occasion, we used our nets in every suitable place *en route*, and the list of captures appended will show that our efforts were not altogether unproductive.

Arrived at Avignon on August 1st, a walk outside the walls by the river gave us some much-needed coolness, and we saw

several butterflies, including a fine male *Apatura iris* and a large number of *Colias edusa* flying very fast. In the evening we went on to Arles, and the next day we saw *Colias edusa* and many other insects, including *Pontia daplidice*. About three in the afternoon we started on our first tramp, from Arles to St. Gilles. The road was dusty and the heat great, but we caught a few butterflies, and found very comfortable quarters at the Hotel du Globe. Early the following morning we were on the road again with Nîmes as our objective, and a clearing by the railway, with a marsh and small copse alongside, yielded our first really interesting bag. From Nîmes we took the train to Narbonne, where serious business began. It was showery on the morning of August 4th, and an occasional thunderstorm led us more than once to take what shelter we could find. Passing through Sigean, we made our way to La Nouvelle. On August 5th we had what was probably our most uninteresting walk, but it was relieved by the capture of two full-fed larvæ of *Saturnia pavonia-major*, which were walking over the dusty road, and which spun up the next day. (A fine female emerged from one of these on May 21st, 1921.)* We also took a very large female *Papilio podalirius* ab. *feisthamelii* in perfect condition, and saw some small larvæ of *Papilio machaon*. Hot and dusty we reached Perpignan about seven, but soon recovered after the excellent dinner provided at the Hotel de la Loge. On the following day we took the train to Argeles-sur-Mer, and walked along the coast through Collioure, Port Vendres, Banyuls-sur-Mer and back again—a delightful walk with grand views of mountain and sea. A few butterflies, chiefly Argynids and Melitæas, were taken on this day, and many *Macroglossa stellatarum* and *Callimorpha hera* were seen among the rocks in the brilliant sunlight. On August 7th we began our tramp at Le Boulou, and walked along the valley of the Tech, over the Pont de Ceret, through Palalda and Amélie-les-Bains to Arles-sur-Tech, where we were fortunate in getting the last available room in the Hotel Glycines. On this road we took our first specimens of *Gonepteryx cleopatra* (which here as elsewhere we always saw flying in company with *Gonepteryx rhamni*), *Leptosia sinapis* and *Issoria lathonia*; we also saw *Charaxes jasius* flying high among the tree-tops, but we could not entice him into our nets. *Papilio podalirius* ab. *feisthamelii* and *Papilio machaon* were in profusion, but mostly in rags. Though we were up betimes on August 8th our start was delayed, because we could get no breakfast till the kitchen fire was lighted (and they seemed disinclined to hurry the process). However, we were off before the heat of the day, and began a long and arduous climb through Corsavy up to the Col de la Cirère. When we were within a short distance of the iron mine at Batère we were overtaken by a severe storm of thunder and

* The other, also a female, emerged May 21st, 1922.—F. A. O.

hail, and we considered it prudent to make a halt at the cantine, where eventually we stayed the night. The people were most friendly, and the proprietor of the cantine rose to the unusual occasion in fine style. Next morning we did not go over the Canigou, but skirted round it to Valmanya. The views all round us were magnificent, and we took a large number of butterflies, including *Erebia tyndarus* var. *rondoni* and *Erebia neoridas*. In places the going was bad, owing to the uncertainty of the track and the loose stones, and so we could not pursue what we took to be a *Parnassius* some distance above our path—the only *Parnassius* we encountered during the whole trip. We had a long rest and some extremely refreshing beer at the Café du Canigou at Valmanya, prior to our 16 kilometre tramp to Vinca, through a magnificent winding gorge, with a thunder-storm passing behind but not overtaking us. At Vinca we struck what was perhaps the least comfortable hotel of the trip, but even here the food was good. On August 10th we walked to Vernet, and as the day was overcast we caught little. On the following day we tramped through Olette and Fontpédrouse to Mont Louis—a grand walk, with rushing torrents far below us and little streamlets leaping down the mountain sides. On August 12th we had another glorious walk through Saillagouse to Bourg Madame, where we arrived in a deluge. But we were soon comfortably installed in the Hôtel Salvat, and towards dinner-time it cleared. On the following morning we started early for a longish tramp over the Col de Puymorens to l'Hospitalet. The views into Spain are grand, and the short cut across the rough ground from the Col down to l'Hospitalet saved us a good many kilometres. We got some good butterflies on this day, and just before reaching the Col we saw our first *Euanessa antiopa*. On August 14th we walked through intermittent showers to Ax-les-Thermes.

On the 15th we woke to find it raining in torrents, and it looked like continuing to do so for the rest of time. But it had cleared a little by ten o'clock, so we started off, prepared for a wettish walk over the Col de Chioula and the Col de Marmare to Belcaire. All the valleys on the way up were obscured by mist, so we did not see much.

On the following day—August 16th—after passing through Espezel and down many zigzags, we came upon such a profusion of butterflies as I had never before seen: *Gonepteryx cleopatra*, *G. rhamni*, *Limenitis camilla*, many Vanessids and Argynnis, and countless swarms of *Leptosia sinapis*, *Colias edusa* and *C. hyale*, *Papilio machaon* and *P. podalirius* ab. *feisthamelii*. Browns and Blues, *Satyrus hermione* on the tree-trunks, etc. The Blues and Whites were mostly in large bunches on the road wherever there was a damp patch, and they rose in clouds as one got close to them. This profusion lasted all along through Belfort,

Joucou and Marsa, and as the road was on a gentle decline through the truly magnificent Gorge of the Rebenty, this day stands out in the memory. (In 1921 we revisited this same gorge, but it was a dull day and we took next to nothing.)

The next morning (August 17th) we walked south from Axat for a few kilometres through the Gorge of St. George, and were rewarded at its further end by another prolific bag in a small clearing by the riverside. Most of the species we had met with on the previous day were again taken here, as well as some nicely marked *Melitaea phoebe* and some large *Agriades corydon*. After spending a couple of hours on this delightful spot we returned to Axat, and went on to Quillan through another fine gorge (Pierre Lys), in which we saw a few butterflies and found a full-fed larva of *Papilio machaon*, which duly produced an imago on June 8th, 1921.

This practically finished the entomological part of our trip in 1920, for on the following days we walked along the valley of the Aude through Esperaza Couiza and Alet to Limoux, and thence to Carcassonne, where our interests were other than entomological, though we saw many Whites in the Hautes Lices within the city walls.

In 1921 we reversed the order of our trip. Starting at Carcassonne on August 6th, in the scorching sunshine, we went on to Quillan, where we spent three weeks.

On August 25th we left Quillan for Perpignan, and from Perpignan we went to Banyuls-sur-Mer. On September 2nd we returned to Paris.

Mr. Rowland-Brown and Mr. Bethune-Baker have very kindly looked through my captures, so the following list can be relied upon:

HESPERIIDÆ.—*Carcharodus lacaterae*, *C. althaeae*, *C. alcaeus*, *Hesperia fritillum* (= *cirsii*), *H. alceus*, *H. onopordi*, *Pyrgus sao*, *Nisoniades tages*, *Pamphila sylvanus*, *Thymelicus actaeon* (very worn), *T. flarus* (= *thauamas*).

LYCENIDÆ.—*Chrysophanus doris*, *Rumicia phlaeas*, *Nomiades semiargus*, *Everes argades* ab. *coretas*, *Agriades corydon*, *A. beilargus*, *Lycæna baton*, *Polyommatus escheri* var. *rondoni*, *P. icarus* (several of the *arcuata* form) and ab. *icarinus*, *Aricia medon*, *Plebeius argus*, *Lampides boeticus*.

ERYCINIDÆ.—*Nemeobius lucina*.

PAPILIONIDÆ.—*Papilio podalirius* ab. *feisthamelii*, *P. machaon*, *Parnassius apollo*? (seen only).

PIERIDÆ.—*Pieris brassicae*, *P. rapae*, *P. manni*, *f. rossi*, *Pontia daplidice*, *Leptosia sinapis*, *Colias hyale*, *C. edusa* and ab. *helice*, *Gonepteryx rhamni*, *G. cleopatra*.

NYMPHALIDÆ.—*Dryas paphia*, *D. pandora*, *Argynnis aglaia*, *A. alippe*, *Issoria lathonia*, *Melitaea phoebe* (very varied), *M. didyma* (including one small male, probably of the third brood), *M. athalia*, *M. cinxia*, *Pyrameis cardui*, *P. atalanta*, *Euranessa*

antiopa, *Vanessa io*, *Aglaia urticae* (only one taken). *Polygonia c-album*, *Limenitis camilla*, *Apatura iris* (seen at Avignon), *Charaxes jasius* (seen near Amélie-les-Bains).

SATYRIDÆ.—*Pararge megaera*, *P. egeria*, *Satyrus hermione*, *S. fidia*, *S. aleyone*, *S. circe*, *S. statilius*, *Enodia dryas*, *Hipparchia briseis*, *H. semele*, *H. arethusa*, *Epinephele jurtina* var. *hispulla*, *E. tithonus*, *E. ida*, *Coenonympha pamphilus*, *Erebia epiphron* var. *cassiope*, *E. neoridas*, *E. tyndarus* var. *rondoui*, *Melanargia galatea*.

FURTHER NOTES ON SARROTHRIPUS REVAYANA, SCOP.

By W. G. SHELDON, F.Z.S., F.E.S.

AT the sale of the concluding part of the Farn Collection on the 4th inst. the rather extensive series of this species came into my possession; and as it included three very interesting specimens, I am writing this note as an addenda to my paper on *S. revayana* which appeared in vol. lii of this magazine. In this paper I alluded to the *supposed* type-specimen of ab. *stoninus* described by Curtis, and which is at present in the possession of Prof. Image. Now this specimen was formerly in the collection of Dr. P. B. Mason, who acquired it from the late Edwin Shepherd, whose collection he purchased "en bloc." Unfortunately it does not agree with Curtis's description of ab. *stoninus*, and I have therefore named it ab. *sagittata*, and figured it, fig. 4 on plate. I have also figured the true ab. *stoninus*, fig. 5. Now amongst Farn's specimens is an example of ab. *stoninus* labelled as such, or rather as "ab. *stonanus*, Sheppard."* This example was on one of the old round-headed pins and would thus in any case date *ante* 1850, or possibly about the date (1829) in which year Curtis named the aberration. The specimen was no doubt acquired by Farn at the sale of the late A. F. Sheppard's Collection (with which was incorporated that of E. Sheppard) in 1889. I am wondering whether the specimen was not the actual type that Curtis described. Curtis never possessed a type, and apparently the example he described was in the possession of a collector, Stone, well known in those days. Curtis says it was taken at Darenth. Both Stephens and Westwood, however, speak of it as taken at Birchwood. They each write of one example only, and I cannot find any evidence that more than one was known in those days, when it was unquestionably extremely rare. In any case an example of such an age labelled as ab. *stonanus* is satisfactory proof that the old Lepidopterists correctly understood the form.

* Stephens and Westwood both corrected Curtis's ungrammatical name of *Stoninus* to *stonanus*; but as Curtis himself adhered to his first name, although he had several opportunities of correcting it, I have, following the law of priority, adhered to his nomenclature.

The second interesting specimen in the Farn Series is an example very close to the very rare (in Britain at any rate) type form. Scopoli describes this—"Superior wings greenish grey with fuscous longitudinal lines." The Farn specimen was clear grey with a slight brown tinge, superiors with blackish longitudinal lines, a black discal spot, and *slight* indications of dark transverse waved lines. There is no trace in this specimen of the reddish-brown ground-colour of the superiors of *ab. ramosana*, Hub., and it certainly is nearer to the type than any example I have seen. It is labelled "New Forest, A.B.F."

The third noticeable specimen is an example of *ab. degenerana*, Hub. At the date I wrote my paper I had only seen one example of this the most beautiful of all the *rerayana* forms, purporting to be of British origin, which was said to have been taken by a professional collector, E. Morris, in the New Forest. Since then I discovered there was an example in the Webb Collection, acquired by him from the Briggs Collection in 1896, and originally in the Howard Vaughan Collection. This example is the one alluded to by Barrett in 'Lep. Brit. Isles,' vol. vi, p. 235, and is described in the last few lines at the bottom of the page. I am not aware that the place of origin of this specimen is known. At the Webb sale the name of the purchaser was not disclosed, and therefore I do not know its present location.

The Farn *ab. degenerana* is labelled "Chattenden," without any indication of the name of the captor, or of the source from which Farn obtained it. The example is set in the English fashion, with wing slope rounded; it was mounted on a gilt pin of the usual British make, and apparently was set between the dates 1850 and 1890. It is of the average size of *S. rerayana*, expanding about 24 mm.; whereas Continental examples of this form are usually considerably larger than other forms. There does not seem any reason to suppose that this is anything but a genuine British example. The Farn series of *S. rerayana* was badly affected by verdigris, and I have for this reason removed the old pins, and substituted for them verdigris-proof pins.

April 12th, 1922.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 110.)

9. PROCTOTRYPES BUCCATUS, Thoms.

Proctotrupes buccatus, Thoms., l.c., p. 421, ♀. *Serphus buccatus*, André, l.c., p. 302, ♀.

Though only recorded from Sweden, this is not an uncommon species with us, and seems confined to the autumn. It ranges from August 9th, when I took it in the West Leake Woods, near Nottingham, in 1914, to October 8th, when it occurred under some sacking lying on the ground in Dodnash Wood, in Suffolk; it has occurred by sweeping at Blythburgh Wood, and I have noticed it on the Lowestoft cliffs flying slowly and hovering over the sand, about half-way up their face, on an oppressively hot morning with slight westerly breeze. Foxhall (Tomlin): Tostock, near Bury St. Edmunds (Tuck); Felden, in Herts (Piffard).

10. PROCTOTRYPES ELONGATUS, Hal.

Proctotrupes elongatus, Hal., l.c., p. 11, ♀. *Serphus elongatus*, André, l.c., p. 302, ♀.

Somewhat rare in northern Ireland, "in litoribus" (Haliday), which Kieffer considers to mean "rivage de la mer." It has not been anywhere discovered since first described in 1839, and is said to be similar in its abdominal and terebral structure to *Paracodrus apterogynus*; nor is the male yet known.

11. PROCTOTRYPES CALCAR, Hal.

Proctotrupes calcar, Hal., l.c., p. 12, ♂ ♀; Voll., l.c., p. 28, pl. xix, fig. 10, ♀. *P. calcaratus*, Thoms., l.c., p. 419, ♂. *Serphus calcar*, André, l.c., p. 306, ♂ ♀.

The large radial cell, combined with elongate pale legs and evenly sculptured metathorax, render this a very distinct species.

A common insect in woods from spring to autumn, extending throughout Europe, from Sweden to Spain and Algeria. Haliday considered it very common in woods and among grass on coast sandhills, and recorded it from England. For its most interesting parasitism upon the centipede, *Lithobius forficatus*, cf. Edward Newman's paper in 'The Entomologist,' iii, 1867, p. 342, "A Proctotrupes Parasitic on a Myriapod"; I know of no subsequent breeding. One of our commonest species, at least in the east of England, and ranging from early May to September 8th, most abundant in June. About half my localities are on the coast, but it also frequently occurs inland in marshes, and sometimes on lime-tree honey-dew, at Barton Mills. Mildenhall, Monks Soham, and Walberswick in Suffolk; Bury St. Edmunds (Tuck); Mablethorp, in Lincs, and Newstead, in Notts (Morley); Clacton-on-Sea (Newbury); Felden, in Herts, several (Piffard); Reigate, in Surrey (W. Saunders); Lyme Regis, in Dorset (Chitty); New Forest (Lyle); Olveston, in Gloucester (Charbonnier); Arnold, Edwinstow, in Sherwood Forest and Aspley Woods in June, Thorney in August; and Epperstone Park during September, in Notts (Carr); Killarney, in S.W. Ireland.

12. PROCTOTRYPES CURTIPENNIS, Hal.

Proctotrupes curtipennis, Hal., l.c., p. 12. *Serphus curtipennis*, André, l.c., p. 300, ♀.

Instantly known by its brachypterous condition; but the structure, and especially that of the metathorax and terebra leaves little doubt that it is a mere form of *P. calcar*. Two specimens alone are recorded, both from England, but unlocalised; one was taken by John Curtis long before 1839, as mentioned in his Guide of that year (Haliday), and the other is in Marshall's collection, which is in the Vienna Museum. It has not been found in Ireland, *pace* Kieffer. I am the fortunate possessor of a third specimen, kindly given me by Rev. H. S. Gorham, who captured it during 1907 at Malvern, in Worcester; and Dr. W. J. Fordham found another in 1917 at Bubwith, near Selby, in Yorks.

13. PROCTOTRYPES SETICORNIS, Thoms.

Proctotrupes seticornis, Thoms., l.c., p. 419, ♂ ♀. *Serphus seticornis*, André, l.c., p. 304.

Hitherto known only from Sweden. A single female was swept by me so long ago as October 7th, 1899, in a very swampy alder wood in the Bramford marshes, near Ipswich; and another on June 14th, 1907, from bracken in the particularly dry Wilverley Inclosure of the New Forest. But actually I expect it to be one of our commonest, though overlooked, species, for fully a dozen were sitting quiescently below lime-leaves on June 20th, 1919, in my Monks Soham garden after a thunderstorm.

14. PROCTOTRYPES FUSCIPES, Hal., ♂ ♀.

Proctotrupes fuscipes, Hal., l.c., p. 13, ♀. *Serphus fuscipes*, André, l.c., p. 307, ♀.

Taken near Edinburgh during September; also very rarely in northern Ireland (Haliday). Not rediscovered since first described, and the male is hitherto unknown, though it differs only sexually from the female, and the species is really one of our commonest. It is on the wing from May 18th, when it emerged with the above *Disognus areolator*, to September; usually swept from reeds and rushes in marshy places, but it also occurs in some numbers on honey-dew on lime leaves in my garden here, especially during thundery weather late in the day. Felden in Herts (Piffard); Sherwood Forest in June (Carr); in a wicker beehive at Bury St. Edmunds (Tuck); Rookley Wilderness in Isle of Wight (Morey); and Banchory in the Kincardine highlands of Scotland (Elliott). My numerous examples are from Brandon Stauch, Monks Soham, Henham Park, Barton Mills, Ousden on banks of the River Kennet, Easton Broad, Southwold, Reydon, Westleton, in Suffolk, Louth in Lincs, and Chippenham Fen in Cambs.

15. PROCTOTRYPES PALLIPES, Jurine.

Codrus pallipes, Jur., Nouv. Méth., 1907, p. 309, pl. xiii, gen. 46, ♂: Nees, l.c., p. 356, excl. syn. et var. *Proctotrupes pallipes*, Latr., Gen. Crust. et Ins., p. 38; Hal., l.c., p. 11, ♂ ♀; Thoms., l.c., p. 418, ♀: Voll., l.c., p. 29, pl. xix, fig. 1. *Serphus pallipes*, André, l.c., p. 309.

This species should certainly be ascribed to Jurine, and not to Haliday as is done in André; for nothing in the former's account is inaccurate but the antennal coloration, which is depicted as flavidous throughout. Haliday's two varietal forms appear quite different to me. The centrally produced propleuræ are distinctive of the present species.

Wide-spread from Hungary to Sweden; Vollenhoven records it (l.c.), as preying on the fungus-gnat, *Macrocera maculata*, Mg. Frequent everywhere in woody places in Britain (Haliday and Walker). I have found it very far from common, and pretty well confined to the month of June; it has always turned up at random in the sweep-net, or flying in sunshine, and several times in shady places in woods at Foxhall, Wherstead, Ipswich, Barton Mills and Tuddenham in Suffolk; Market Rasen in Lincs; Helpstone Heath near Peterborough, and Matley Bog in New Forest. There seems to be an entirely different mode of life to the above Mycetophilid suggestion, for Kawall says ('Stett. Entom. Zeit.', 1855, p. 260): "Many years ago, I found under a stone a shrunk beetle larva, which undoubtedly belonged to the *Staphylinæ*, dead. In it were several parasites in naked pupal state; these proved to be *Codrus pallipes*, Jur."; and there is no reason to suppose that he mistook *P. viator* for the present species, as I myself did ('Trans. Entom. Soc.', 1911, p. 453), in ascribing Mr. Step's breeding to it.

(To be continued.)

NOTES AND OBSERVATIONS.

THE DIPTEROUS FAMILY BLEPHARICERIDÆ. — Macquart (1843) wrote *Blepharicera*, but this was amended to *Blepharocera*, and the family has been called *Blepharoceridæ*. It seems evident that the original spelling must be restored, and the family name changed to *Blephariceridæ*. Were we to permit such changes in the spelling of generic names, it would be impossible to save the name of the *Blepharicerid* genus *Phylorus*, Kellogg, long antedated by the *Lepidopterous* *Phyloros*, Walker.* I will take occasion to record that by St. Vrain Creek, above Peaceful Valley, Colorado, August 23rd, I found the *Blepharicerid* *Bibiocephala elegantula*, V. Röder, preying upon the subimago of a mayfly (Ephemeridæ).—T. D. A. COCKERELL.

* If we consider an "emendation" equivalent to an error in spelling, and hold to the "one-letter rule," the *Lepidopterous* *Blepharocera*, Chambers, stands, preoccupied neither by the *Dipterous* genus nor by *Blepharocerus*, Blanchard. This seems to me the proper course, following the spirit of the International rules, and the obviously wise principle that names should not be changed without absolute necessity.

VANESSA ANTIOPA IN SURREY.—In reply to inquiries made, Col. G. J. Farman has kindly given me the following particulars respecting a specimen of *V. antiopa* seen by him at Camberley, Surrey, on April 10th last: "It was a warm, bright day and the butterfly was sunning itself on a bank bounding the Portesbury Road, just off the High Street, which is not much frequented, and at that particular part separates the road from a small plantation. It was a very perfect specimen, wings and body not in the least rubbed. I watched it for some minutes at a distance of a couple of yards. It was still there when I left." It is always interesting to record the appearance of *antiopa* in this country, especially those which have hibernated, as comparatively few have been recorded during the spring months. In my series of twelve British-caught *antiopa* only two are hibernated examples. —E. W. FROHAWK.

VANESSA CALBUM IN BUCKS.—On May 6th I was surprised to capture a specimen of *Vanessa calbum*: it was flying at Aston Hills near Tring. Apparently there are no other records of this insect from the Tring district in the back numbers of the 'Entomologist.' —G. E. TITE; Park Road, Tring.

HIPPOTION CELERIO IN DEVONSHIRE.—Cadet T. E. Podger, who is an enthusiastic young collector, has written to me from Dartmouth Royal Naval College, stating that a female specimen of this insect has been taken at rest in one of the College sheds on May 13th. —F. G. S. BRANWELL; 1, Dyke Road Drive, Brighton.

A STRIPED HAWK MOTH (*H. celerio*) was found here last Saturday, (May 13th) by Chiet Stoker Seccombe fluttering about the boats near the river. It was caught, and I have the insect. I think it is a male. —R. M. MILNE; R.N. College, Dartmouth, May 15th, 1922.

VANESSA IO AB. BELISARIA.—It may be of interest to record that a specimen of this aberration of *V. io* (the "blind" Peacock) was captured at Selworthy in August, 1919, by Miss Thompson, of 97, Albemarle Road, Beckenham, and recently shown to me. —N. D. R.

NOTES FROM BROCKENHURST.—*Ctenodonta campestris*: The green Tiger Beetle is exceedingly abundant; I never saw so many. Apparently the hot summer was good for them. *Gonepteryx rhamni* has been common on suitable days, as usual. *Vanessa io* appeared on April 19th, apparently just out of hibernation. *V. atalanta*: On May 5th I saw two, which I think must have hibernated. *P. egeria* was first seen on April 26th: it has since become very common. *Cynthia argyrolus* was first seen on May 6th: it is now pretty common. I have seen only one *Aglais urticae*—on May 7th—and but one *Heodes phlaeas*—on May 12th. The season of course is very late—perhaps a fortnight behind. —W. J. LUCAS.

PERCNOPTILOTA FLUVIATA AND OTHER CAPTURES IN WESTMORLAND.—I should like to record the capture of *P. fluvjata* in Witherslack on May 11th last. This moth was taken at car head-lights in a lane at 10.30 dusk. Its identity has been confirmed. Night work has been difficult this year, much snow in the mountains off and on until mid

* One or two *H. phlaeas* have been seen on parade banks at Clacton each sunny day from 12th May. —R. S.

May and all "earliest dates" for the year behind time. The only early arrival was *C. glaucata* on April 21st at Holker. Sallow work has been very bad indeed, and most work done by "light." The past week has been very bad, with high winds or heavy rain each night. I am told that *Euchaeca oblitterata*, which I found locally common in 1921, and *Perizoma affinitata*, of which we took six in 1921, are new records for the district. Up to May 13th fifty-one local "earliest dates for 1922" have been listed.—Dr. LOWTHER; Grange-over-Sands, May 17th, 1922.

DEIOPEIA PULCHELLA BRED FROM S. DEVON LARVA.—A friend of mine brought me, last year, from a South Devon locality, a larva that was not known to me. I fed it upon forget-me-not (*Myosotis*), for which plant it appeared to entertain a partiality, subsequently pupating. I have since forced through the resulting pupa, from which a fine specimen of *D. pulchella* emerged last Saturday. I write this as it might be interesting to record in the 'Entomologist.'—J. M. JAKES; The Red House, Banstead, Surrey, April 20th, 1922.

OCCURRENCE OF FORFICULA AURICULARIA, LINN., VAR. FORCIPATA, STEPH. IN SURREY.—I found about 8 to 10 specimens of this variety in an old rotten gate-post, about 4 foot high, near Wisley Bridge, Surrey, on March 10th, 1922. There were no other earwigs present in this spot, only that particular variety, and all, of course, of the male sex.—G. FOX-WILSON; Entomological Dept., Royal Horticultural Society's Gardens, Wisley, Ripley, Surrey.

RHOPALOCERA FROM RHODES, SAMOS, GALLIPOLI, ETC.—The following notes from the Islands of Rhodes and Samos, the country round Maidos on Gallipoli, and the Island of Afisia in the Sea of Marmora, may be of interest. We only stopped at the above places for a very short time, and at Samos and Afisia I was only able to get ashore for a couple of hours between 5 and 7 p.m., local time. The weather, except at Gallipoli, was very bad, and collecting at Rhodes was done during a very heavy thunderstorm, which lasted two or three days. I am indebted to Major P. P. Graves for the identification of the specimens of *S. hermione* from Rhodes, *E. lupinus*, *E. telmessia* and *A. hyrax*, and for confirmation of identification of *P. zephyrus*. Owing to weather and time at my disposal, Gallipoli, in the neighbourhood of Maidos, is the only one of the above places which can be considered to have been thoroughly worked.

A. = Afisia, G. = Gallipoli, R. = Rhodes, S. = Samos.

Papilio podalirius, **R.**, one. *P. machaon*, **R.**, larva full fed; **G.**, imago. *Aporia crataegi*, **G.**, common, worn. *Pieris brassicae*, **R.**, *P. rapae*, **G.**, **A.** *Pontia daplidice*, **R.**, **G.** *Leptidia sinapis*, **G.** *Colias edusa*, **G.**, plentiful; var. *helice*, **G.**, one. *Gonepteryx cleopatra*, **S.**, one. *Argynnis maia* (*pandora*), **G.**, fairly common. *A. lathonia*, **G.**, one fresh male. *Melitaea didyma*, **G.** *M. phoebe*, **G.** *Polygonia egea*, **S.** *Vanessa polychloros*, **S.**, three females; **G.**, not uncommon. *Pyrameis atalanta*, **S.**, **G.**, **A.** *P. cardui*, **R.**, **S.**, **G.** *Limenitis camilla*, **S.**, **G.** *Pararge roxelana*, **R.**, **S.**, common; **A.** *P. maera*, **R.**, tolerably common; in proportion to *megaera* of 7:4; **S.**, equal proportion to *megaera*. *P. megaera*, **R.**, **S.** *Coenonympha pamphilus*, **G.** *Satyrus circe*, **A.**, one fresh male. *S. hermione*, **R.**, one worn male and two

fresh females; more unicolorous grey on the underside of the hind wings, and more fulvous on the upperside of the fore wings along the submarginal band than Constantinople specimens; considered by Major P. P. Graves to be a race local to Rhodes, the specimens from Samos approximating to Constantinople specimens. *S.*, common. *S. briseis*, *G.*, males common and in very good condition; females just emerging, two taken. *S. semele*, *S.*, common. *Epinephele lupinus*, *G.*, plentiful along the dried-up water-courses, keeping to the shade; *A. E. jurtina*, *G.*, *A. E. telmessia*, *R.*, *S.*, males few in number and very worn; the females common and in good condition; the apical eye on all females examined, except one, was bipupillated both above and below. *Melanargia larissa*, *G.*, absolutely swarming everywhere, especially amongst patches of Scabious; by far the commonest butterfly on Gallipoli, where insects of all descriptions were very plentiful; formed about 70 per cent. of the butterflies seen. *Therapia ilicis*, *S.*, *G.* *Heodes thersamon*, *R.*, one female. *H. phlaeas*, *R.*, *S.*, *G.* *Lampides bacticus*, *R.*, common; *S.*, one female. *Tarucus telicanus*, *S.*, several seen. *Polyommatus argus*, *G.*, very worn. *P. zephyrus*, *G.*, two males and three females. *P. bariis*, *G.*, two females, somewhat worn. *P. astrarche*, *S.*, *G.* *P. uarus*, *R.*, *G.*, *A.* *P. ananias*, *G.*, one male, worn. *P. therites*, *R.*, several taken in fairly good condition. *P. argiolus*, *S.*, *G.* *Carcharodus alcaeus*, *R.*, *G.* *C. orientalis*, *G.* *Hesperia sidae*, *G.*, one female in fair condition. *H. eribater*, *A.*, one fresh female. *Adopata actaeon*, *R.*, *G.* *A. thaumas (flara)*, *G.*, common. *A. harar*, *S.*, one worn male. *Augiades subreus*, *G.* *Gecinus nestoramus*, *G.*, common in one small area.

The dates for the above captures or observations are as follows: Rhodes, June 5th and 6th, 1921; Samos, June 8th, 1921; Gallipoli, June 10th, 11th, 12th and 13th, 1921; Asia, June 16th, 1921. — E. B. C. BETTS; Observer Officer, R.A.F.

ATTRACTIVENESS OF LIGHT FOR MOTHS.—The notes under this heading in the last two issues of the 'Entomologist' open up a most interesting question. Many old lepidopterists must have noticed, as I have done, that even the old-fashioned oil-lamps were not all equally attractive, or equally attractive on all nights. Sometimes every moth appears to "come to light," while perhaps on the following night, though equal numbers may be upon the wing, comparatively few will be taken. With street lamps my experience has not been very extensive, but when motor cars first came in I used to find the lights they carried (or some of them at any rate) very attractive; nowadays one seldom sees insects fluttering round the dazzling head-lights. To turn to another aspect of the question, there seems no reason to doubt that the antennae of certain insects (midges as well as moths) may play a part as emitters and receivers of sound-waves, but that any such "calls" could originate from a lamp I should think extremely doubtful. In any case, like would surely only call to like. The same call would not bring up the other species, nor the crowd of other moths, beetles, flies, and even other creatures, commonly attracted to one and the same lamp. It would surely follow that it is the light only which attracts, and it would be very interesting if somebody could demonstrate why one form of light is more attractive than others, or if some light-rays are actually repel-

lant. That scent is certainly the chief (if not the only) sense that attracts male moths to a female would seem to be proved by the fact that the box, or pocket, in which the female may have been carried does not instantly cease to be attractive with the removal of the captive, or with the ending of her life. I have seen Eggars and Emperors drawing up wind to a female for quite surprising distances, but I never remember to have seen one come in the contrary direction.—GEORGE BOLAM; Alston, April 24th, 1922.

FLASHLIGHT PHOTOGRAPHY AND NATURE.—At a recent meeting of the Lancashire and Cheshire Entomological Society Mr. Wilkinson showed how the student who had little daytime leisure for camera work could obtain better results at night by means of flashlight, and at the same time gather a series of records of nocturnal habits of insects and other creatures of great value to science. There is a vast field of research in this direction, for as yet only the fringe has been touched, and the speed of the exposure—about $\frac{1}{5000}$ th of a second—makes the operator almost independent of the movements of the subject. The slides showing the change of the caterpillar of *Pyrameis cardui*, for instance, proved this unmistakably: during the process of getting rid of its old skin the caterpillar is in a state of rapid oscillation, but the photographs were as clear and definite as if the insect had been at rest. The succession of pictures showed the different stages of this metamorphosis from the first spinning up of the larva to emergence of the butterfly.—CHARLES P. RIMMER.

RECENT LITERATURE.

INDEX ANIMALIUM: 1801-1850. Pt. I: Introduction, Bibliography and Index—A-Aff. By C. D. SHERBORN. 8vo. Pp. i-cxxi and 1-128. London: By Order of the Trustees of the British Museum, 1922.

Zoological workers in all groups who know a good thing when they see it, and especially those who value accuracy in nomenclature, will welcome with thanksgiving this further instalment of the fruits of Mr. Sherborn's years of self-sacrificing labours. To catalogue a small group of animals is no light task; to index accurately all the names applied to animals over a period of fifty years is indeed heroic. The amount of work done is clearly shown by the great length of the bibliography, which alone will save many trying hours of labour to other workers in this field. There can be no two opinions as to the value of the work; it is indispensable. We strongly advise *all* systematic workers to get it and to use it.

N. D. R.

Report of the Proceedings of the Fourth Entomological Meeting held at Pusa, February, 1921. Edited by T. BAINBRIGGE FLETCHER, R.N., F.L.S., etc. Pp. xii + 401. Plates I-LVII. Calcutta: Government of India, 1921.

Naturally composed mainly of matter of economic interest, this volume is quite up to the standard of its forerunners in quality if not in bulk. Well over half the volume is devoted to lists of crop pests, observations on miscellaneous pests; forest, medical and veterinary

entomology, lac, etc. Amongst the papers on bionomics, systematic entomology, etc., we note "A Check List of Coccidæ of the Indian Region," by T. V. R. Ayyar, and a paper on the "Proportion of ♂ forms of *Popilio polyes*, L., in Dehra Den, U.P., and Bihar," by Prof. E. B. Poulton. But it is impossible even to indicate the scope of the work in the space at our disposal, its interests are so many and varied.—N. D. R.

The Scottish Naturalist, March to April, 1922.

Apart from a number of notes and articles of general interest, varying from the homing of salmon to the history of feathers, this number contains a valuable and well-illustrated article, "Notes on Aphides from Sutherland," pt. i. by Miss Dorothy Jackson, whose work on this group is already widely known.—N. D. R.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 15th, 1922.*—Prof. E. B. Poulton, M.A., F.R.S., etc., Vice-President, in the Chair.—The following were elected Fellows of the Society: Messrs. Reginald Charles Tricherie, Entomological Branch, Department of Agriculture, Ottawa, Canada; T. G. Sloane, Moorilla, Young, New South Wales, Australia; William Monod Crawford, B.A., Orissa, Marlborough Park, Belfast; Leonard Charles Bushby, 11, Park Grove, Bromley, Kent; Arthur Morel Masee, "Park Place," The Common, Seven Oaks, Kent; Linnaeus Greening, "Fairlight," Grappenhall, Cheshire; John Wilson Moore, 151, Middleton Hall Road, Kings Norton, Birmingham; John Edmund Eastwood, Wade Court, Havant, Hants; Dr. Francis Arthur, M.R.C.S., L.R.C.P., 395, Bethnal Green Road, E. 2; and Dr. H. Silvester Evans, M.R.C.S., L.R.C.P., Lautoka, Fiji. *Exhibits.*—Mr. W. H. Tams exhibited a selection of insects, chiefly Lepidoptera, taken on the Mount Everest expedition.—Mr. O. E. Janson exhibited a new species of *Euchroea* and a female of the rare Saturniid moth *Argema mittrei* from Madagascar.—Dr. C. J. Gahan exhibited an example of the Indian Phasmid *Carausius merosus*, in which homœotic regeneration had taken place, an amputated antenna having been replaced by a tarsus.—Prof. E. B. Poulton, F.R.S., who illustrated his remarks with lantern-slides, read some notes by Mr. A. H. Hamm on the occurrence of *Synatomaspis druparum* in hawthorn seeds in birds' droppings, and some notes by Dr. R. C. L. Perkins on the procryptic resting attitude of *Poligenia c-album*. He also exhibited some Chalcids bred by Mr. J. Collins from beetles in dog biscuits and plum branches.—Dr. S. A. Neave read a letter from Mr. W. J. Harding recording the capture of *Grapha c-album* at Holcombe in Devonshire, and some discussion took place as to the distribution and recent spread of this butterfly in the south of England.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*February 23rd.*—The President in the Chair.—Mr. Cheeseman, 30, Clayton Road, S.E., was elected a member.—Mr. Hugh Main exhibited slides illustrating the latest results of colour photography, and series of slides illustrating the life-history of the field-cricket and the wolf spider *Lycosa*.—Mr. Frisby, slides showing the Serotine bat, nests of water-fowl, and

British orchids *in situ*.—The President, slides of the liverwort showing remarkable proliferous growth, of "fairy flies" and of the tracheæ of a beetle.—Mr. Syms, slides of the ova of the more local species of British butterflies.—Mr. Tonge, slides of the ova of a number of British Geometers.—Mr. Staniland, slides of the galling of the wild crab by the woolly aphis *Eriosoma lanigera* and of the Syrphid (*Syrphus vitapennis*).—Mr. Withycombe, a curious fungus growth from a dead ant, a nest of *Osmia rufa* in a door lock, the egg-mass of *Empusa pauperata*, the life-history of a *Coniopteryx*, etc.

March 9th.—The President in the Chair.—Mr. G. C. Champion, A.L.S., F.E.S., was elected an honorary member: Mr. L. C. Bushby, of Bromley, and Mr. A. M. Massee, of Sevenoaks, were elected members.—Captain J. Ramsbottom, F.L.S., gave a lecture on "Symbiosis of Fungi and Orchids," illustrated with lantern-slides and diagrams.—HY. J. TURNER, *Hon. Sec.*

SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—January 23rd, 1922.—The annual meeting was held at Huddersfield at the invitation of Mr. G. T. Porritt.—The President, Mr. B. Morley, was in the Chair.—After election of officers for 1922 and new members, Mr. Mosley, the Curator of the new Huddersfield Museum, made an appeal for the co-operation of the Society in working out the entomology of the district and supplying material for the museum collections.—*Exhibits*: Mr. G. T. Porritt, a specimen of *Ptychoptera minuta* taken by himself at Hornsea, Yorks, June, 1908, probably the earliest known example of this fly.—Mr. B. Morley, various Hepialids, including the whitish Wicken form of *H. lupulinus* and *H. humuli*, var. *thuleus*; *Larentia concinnata*, Arran, and varied series of *L. truncata*, including ab. *rufescens*, from Skelmanthorpe; *Lygris populata*, ab. *musauaria*, from Penistone; *Acronycta menyanthidis*, ab. *suffusa*, a second-brood specimen from Penistone; aberrations of *Agrotis nigricans*, *Lygris testata* and *Ephyra pendularia*.—Mr. Mosley, a collection of Micro-lepidoptera taken at Diggle and presented to the Museum by Mr. F. Buckley.—Mr. E. A. Smith, a long series showing range of variation in *Agrotis fimbria*, Elland, 1921, one specimen having the band of the hind wing traversed by white rays.—Mr. E. Cocker, aberrations of *Arctia caja*, one with yellow and one with heavily-suffused hind wings.—Mr. J. Hooper, series of hybernids, including melanic *H. leucophearia* and *H. aurantiaria*, ab. *fuscata*.—Mr. W. Buckley, *Euchloë cardamines*, ♂, with the patches of a faded lemon colour, a faint sub-terminal grey streak and a grey streak prolonging discal spot to costa.—Mr. W. Dyson, two aberrant specimens of *Pyrameis atalanta*, portions of the bands in one being of a bright orange colour.—Mr. T. Fisher, aberrations of *Xanthia lutea* having the "pink bar" intensified and brown in colour; aberrations of *Abraxas grossulariata* including ab. *nigrosparata*.—Dr. H. D. Smart, a series of *Camptogramma bilineata*, including ab. *atlantica* and ab. *isolata*; *Ennomos quercinaria*, banded and melanic forms; melanic forms of *Hemerophila abruptaria*, *Tephrosia consonaria* and *Acidalia virgularia*.—Mr. Porritt, as far as time allowed, showed portions of his collection of British Lepidoptera, a description of which is beyond the scope of these notes.—H. D. S.

OBITUARY.

ARTHUR W. BACOT.

ENTOMOLOGY—one may add, indeed, the Nation—has suffered another irreparable loss in the death of Arthur W. Bacot, briefly announced in the May number of the 'Entomologist.' Still in the prime of life, and in the midst of varied and important scientific researches, he had, by permission of the Lister Institute, gone to Egypt in Government service for investigations into typhus, and at Cairo he made the "supreme sacrifice" on April 12th. Call the contracting of the fell disease what we may—an unavoidable accident or a result of insufficient precautions—the greatness of that sacrifice remains; and while we deplore the tragedy, we cannot but recognise in it a fitting coronation of a life of singular unselfishness and devotion.

Bacot first became known to the entomological world as a lepidopterist, and during the early nineties of the last century rapidly attained to front rank, mainly owing to his careful work in breeding, his accuracy in describing, and his genius for sound inductive reasoning from his observations. Although he was a keen field-naturalist, the mere collecting for collecting's sake had little attraction for him; to obtain the material was ever a challenge to him to use it for some scientific end. Having assimilated, with surprising quickness and thoroughness, not only the biological theories of the greatest masters (Galton, Weismann, Mendel and others), but also the detailed descriptive methods of Dyar and Chapman on larvæ, pupæ, etc., he devoted himself with the greatest assiduity to the elucidation of the life-histories of a number of our British species and groups, notably some of the Spilingsids, *Euthromus*, the *Laparudæ*, and—in connection with Tutt's monumental 'British Lepidoptera'—the *Lasiocampidæ* and *Psychidæ*.

Most of his earlier papers were produced under the auspices of the smaller natural history societies (the City of London and North London), in which he was a leading light, and were published or re-published chiefly in the 'Entomologist's Record,' vols. iv to xviii. He did not join our premier entomological society until November, 1901, but was thenceforth a regular exhibitor and a valued participant in the discussions.

It was one of the crimes of our economic system that for many years Bacot's best hours were claimed by routine work in a City office, but the reward of his arduous labours as an amateur came when, in 1911, he was appointed Entomologist to the Lister Institute of Preventive Medicine, and thenceforth he was able to follow untrammelled his natural bent for scientific research.

In 1914 appeared Bacot's monograph on the bionomics of the common rat fleas, a research undertaken at the invitation of the Commission for the Study of the Plague in India. This work, which stamped Bacot as an investigator of high order, was carried out at his home in Essex, and during the time that he was forced to work all day at the office. He had the services of an assistant to carry out his instructions whilst absent, but even so the difficulties were great.

Bacot continued his work on the rat fleas at the Lister Institute, where he was able to study plague-infected individuals. In 1913, in collaboration with Dr. C. J. Martin, there was published an important paper demonstrating the mechanism of the transmission of plague by the rat flea.

In 1914-15 Bacot acted as Entomologist to the Yellow Fever Commission sent out by the Colonial Office to Sierra Leone. During the year August, 1914, to July, 1915, he studied the bionomics of *Stegomyia fasciata*, the mosquito which transmitted the disease. These studies formed the subject of a very complete monograph published in 1916 by the Yellow Fever Commission. All engaged in combating mosquitoes or in studying their bionomics will find a mine of information in this work.

Upon his return to England in 1915 he began a long series of experiments on lice to determine what methods were most suitable for ridding our soldiers of this pest. The experiments were always made upon himself and conformed very nearly to conditions in the field. In 1916 he accepted the post of Honorary Entomological Adviser to the War Office. He made valuable recommendations on the louse problem, and all devices and substances for combating this evil brought to the notice of the military authorities were submitted to Bacot for tests and reports.

In 1917 he was invited to join the British Trench Fever Committee appointed by the War Office. The study of the louse had now become more vital than ever as it was thought to be the agency transmitting trench fever. Bacot and his colleague Dr. J. A. Arkwright demonstrated the existence of minute organisms, similar to the *Rickettsia* associated with typhus, in the gut of lice fed upon patients suffering from trench fever. It was further established that only lice carrying these organisms were capable of transmitting the disease.

At the close of the War he turned his attention to typhus. In 1920 he went to Poland with the Typhus Research Commission of the League of the Red Cross Society. Returning to London in a few months he pursued his experiments in an endeavour to decide as to the real nature of the typhus virus. Circumstances were not favourable, and he welcomed the opportunity of going to Egypt at the invitation of the Egyptian Government. Accompanied by his colleague Arkwright, he commenced work early this year in the laboratories of the Public Health Department in Cairo. The research advanced most hopefully, and had already confirmed the statement of an earlier worker that the excreta of infected lice were capable of conveying the disease. At the end of March both men were struck down, but we are glad to hear that Arkwright is making a good recovery.

Bacot was never reckless, and was always most careful in his oftentimes dangerous work. Like several other distinguished students of typhus there is little doubt that he fell a victim to some accident. The nature of the disease and of the insect carrying it renders this research one of the most dangerous nature. As Dr. Greenwood has well remarked: "If ever any man earned the Victoria Cross 'for valour,' that man was Bacot."

He will be remembered by all who knew him as ever helpful and

considerate. Those whose privilege it was to work with him at the Institute found him inspiring and original, and ever ready to give the best of his wide knowledge whenever his advice was sought.

A very appreciative notice of Bacot and his work, from the pen of Dr. C. J. Martin, Director of the Lister Institute, appeared in 'Nature' on May 13th. To this we are indebted for several details concerning the medical side of Bacot's work, and without which any notice would be incomplete.

L. B. P. AND G. T.

R. F. L. BURTON.

All scientists who knew him, those particularly of his native county, Shropshire, much regret the passing of Richard Francis Lingen Burton, of Longner Hall, Shrewsbury, after a long illness, on January 8th last. Born in 1864, and educated at Eton, he was a man of varied attainments, especially devoted to botany and zoology, including entomology. Having lived many years in New Zealand, where he farmed on a large scale, he knew the fauna and flora of that country most intimately, and was successful in growing at Longner many of the endemic plants, which stood the English climate better than might have been imagined. He paid particular attention to the Orchidaceous tribe, both British and New Zealandic, and likewise studied Culicidae, publishing an account of our British mosquitoes, most of which were found to occur on his estate, bordered as it is by the River Severn for a long distance. He also discovered the rare bee-fly (*Pocota apiformis*) to be a native of Salop, and aided much in the compilation of the preliminary Catalogue of the Diptera of this country, which was published in the 'Ent. Mo. Mag.' for November, 1920.

J. C. M.

H. FRUHSTORFER.

We very much regret to announce the death of Hans Fruhstorfer at Munich on April 9th last after an unsuccessful operation for cancer. He was only in his fifty-fifth year.

A man of genial disposition and of untiring energy and boundless entomological enthusiasm, devoted almost entirely to the Rhopalocera, he had during the last 25 to 30 years produced a prodigious number of papers on that subject and written a very large proportion of the Rhopalocera Section of Seitz' Exotic Macro-Lepidoptera, largely based on the results of his own collecting trips abroad. His work contains unfortunately many errors—he worked too fast to allow himself time to check his detail—and in the matter of his racial names many without doubt will have to be discarded. But there will always remain a great deal of value: he is without doubt a great loss to Entomology.

N. D. R.

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BLASTOBASIS LIGNEA WLSM. (LEP.): A SPECIES NEW TO BRITAIN.

BY WM. MANSBRIDGE, F.E.S.

IN August, 1917, Mr. A. E. Wright captured at Grange-over-Sands, N. Lancashire, a few worn specimens of a Tineid moth and others again the following year. Various attempts were made to identify the species without success. The worn condition



Photo, by Mr. Hugh Main.

Blastobasis lignea Wlsm. $\times 2$:—Figs. 1 and 2, typical; 3 and 4, intermediates; 5 and 6, var. *adustella* Wlsm.

of the specimens appeared at the time to be sufficient to account for the inability to determine the name of the moth. In 1919 and 1920 Mr. Wright was fortunate enough to meet with the insect in better condition and in larger numbers. A specimen was sent to Mr. F. N. Pierce, who reported that the genitalia were unknown to him. A larger amount of material now being available a series of the moth was sent to Mr. J. Hartley Durrant, who at once recognised it as *Blastobasis lignea* Wlsm.

The moth appears to be attached to the *Cotoneaster*, *Cotoneaster microphyllum* Wallich, but the association is not certain. The plant is freely cultivated as an ornamental shrub in N. Lancashire, and as an introduced alien is found wild at various places in the Lake District and in N. Wales. There is no

direct evidence yet available that *B. lignea* feeds upon the Cotton-easter; it has been beaten from that plant, but it also comes to the lamp, usually late at night.

When disturbed in the daytime the moth at once drops to the ground, and in the most lively fashion skates about on its back until it finds a crevice where it can conceal itself.

Working upon the supposition that *B. lignea* is a rubbish-feeder the mixture of dead leaves, fallen fruits, etc., from the Cotton-easter has been collected, and any larvae therein have been bred, but hitherto only Diptera have been obtained.

The above facts have been communicated to the writer by Mr. A. E. Wright, who is continuing his endeavours to elucidate the life-history of this addition to the British fauna; and for the following additional notes I am indebted to Mr. J. Hartley Durrant:—

In our lists *Blastobasis* should be placed before the *Oecophoridae*, and it should be noted that the inclusion of *Endrosis* in the *Blastobasidae* (as in Staudinger's Catalogue) is incorrect—*Endrosis* belongs to the *Oecophoridae*. As no full description of this latest addition to the British List has yet appeared in any readily accessible British publication I give below a copy of the original descriptions.

BLASTOBASIDAE.

BLASTOBASIS Z.

Blastobasis lignea Wlsm.

Wlsm. Tr. Ent. Soc. Lond., 1894. 550-1 (1894).

“*Antennae* pale greyish fuscous; basal joint enlarged, tufted and notched in the male, pale cinereous. *Palpi* pale cinereous, shaded and mottled with greyish fuscous externally. *Head* and *Thorax* pale cinereous, the latter shaded with greyish fuscous. *Forewings* pale cinereous, much shaded and speckled with greyish fuscous, with a slight purplish gloss; five small blackish spots (the first on the disc before the middle is sometimes connected with one on the middle of the fold below, and somewhat before it; a small one on the lower edge of the cell lies halfway between these and two spots, the one above the other, at the outer end of the cell); around the apex and apical margin is a series of six or eight ill-defined greyish fuscous spots along the base of the cilia, which are greyish cinereous, sometimes darker towards the apex. *Hindwings* very pale cinereous, with pale greyish cinereous cilia. *Abdomen* missing. *Legs* pale cinereous, somewhat speckled and shaded with greyish fuscous externally. *Exp. al.* ♂ 14, ♀ 19 mm.”

Type ♂ (13681); Type ♀ (13683); *CT.* ♂ (13682); *PTT.* (13684-96), **B.M.** (Mus. Wlsm.).

Hab. MADEIRA; sixteen specimens.

Blastobasis lignea Wlsm. + **adustella** Wlsm.

"In a single specimen the darker shading is more conspicuous, and the two inner spots are merged in an angulated fascia, leaving the dorsal margin at one-third and tending obliquely outwards to the disc before the middle, where it is angulated back towards the costa from what should be the position of the upper spot; but, before reaching the costa, it is again bent upwards and slightly outwards to the margin. Abdomen very pale cinereous, the segments marked by narrow greyish fuscous transverse lines. *Exp. al.* 19 mm."

Type ♀ (13697), **B.M.** (Mus. Wlsm.).

Hab. MADEIRA; one specimen.

"Intermediate varieties in which the fascia is slightly indicated appear to occur, but I have no specimens before me in condition for comparative description."

The capture of *Blastobasis lignea* Wlsm., in some numbers during the last few years by Mr. A. E. Wright, at Grange-over-Sands (Lancashire), is of extreme interest, as it adds not only a species, but a genus and also a family to our lists. I am not aware that, with the exception of Mr. Wright's specimens, this species has been taken anywhere but in Madeira. The first British specimens I saw belonged to the variety *adustella* Wlsm., and tended to confirm an opinion held by Lord Walsingham and myself, that the variety, founded on a single specimen, was probably distinct, but the receipt of other specimens from Grange-over-Sands showed that the species was even more variable than we had thought. The variety *adustella* is an extreme form, but the best one by which to remember the species. Variation from *adustella* takes place in the loss of the strong markings, such specimens being pale and inconspicuous; in the other direction a brownish suffusion produces *lignea*, and some specimens are very dark fuscous (Drnt.).

AN ENTOMOLOGICAL HOLIDAY IN S. FRANCE.

BY K. G. BLAIR, B.Sc., F.E.S.

The insects here noted were collected in the course of a short holiday in the south of France, in May, 1921, in the company of Mr. Hugh Main. The prime object of our trip was the observation, and the photographing in their natural haunts, of the insects that form the subject of the late J. H. Fabre's fascinating series of "Souvenirs Entomologiques," especially of those that cannot be observed in this country. In the short time at our disposal we could not of course hope to discover anything like all of these, and the time of year chosen was too early for many of them, yet the exhaustion of Mr. Main's supply of plates and the running short of our stock of collecting boxes sufficiently demonstrate that we found a very satisfactory proportion of them. Many of the pictorial records of the trip, which were the work entirely of Mr. Main, were on view at the Exhibition of Nature

Photographs held at the rooms of the Royal Photographic Society in February last.

Our trip was divided into two portions—from the 7th to 15th May at Hyères, from which short excursions were made by road or rail to Carqueiranne to the west and Le Lavandou to the east; from the 17th to the 29th May at La Sainte Baume, a locality of which an excellent account from a butterfly-hunter's point of view by the late Rev. F. E. Lowe has already appeared in our pages ('Entom.' vol. xlvii, 1914, pp. 14-20, 60-63). Mr. Main had previously visited this locality in July, 1920, and an account supplementary to Mr. Lowe's is given by Mr. Bethune Baker, who was there at the same time, in 'Ent. Record,' 1921, pp. 101-105. This valley is about 2000 ft. above sea-level, and at the time of our visit the insects as well as the plants were found to be about three weeks later than the same species in the neighbourhood of Hyères.

Though collecting was not our prime object, and was not indeed attempted with any degree of thoroughness, yet a very fair bag was secured. As regards *Rhopalocera*, for example, series were not collected—merely a few samples of the different species noted. Although our stay was five weeks earlier than that of Mr. Lowe, and only half as long, the number of species we secured was exactly half the number recorded by him, viz. 37 compared with 74: Twenty-three of those found at Ste Baume were the same as noted by him, and the following mostly spring species were found in addition to those noted by either Mr. Lowe or Mr. Bethune Baker: *Thais medicagistræ*, *Euchloe tagis*, *E. cardamines*, *E. euphroides*, *Leptidea duponcheli*, *Melitaea aurinia*, *Nemeobius lucina*, *Everes argiades f. coretas*, *Lycæna sebrus*, *L. collaris*, *L. melanops*, *Nisoniades tages*, and *Hesperia silaris* (for these identifications I am indebted to Mr. Riley).

By a mere accident a method of sending these home was discovered that will perhaps repay further trial. The butterflies were papered in the usual way, ordinary newspaper being used, and the envelopes packed in tin boxes which had been moistened with glacial acetic acid, and, owing to corrosion, were useless for the living insects for which they were intended. For some weeks the butterflies remained limp and in perfect condition for setting, and showed no tendency to develop mould.

Of insects of other orders the following are perhaps of interest, the letters (H.) and (S.B.) after the name signifying Hyères and Ste Baume respectively.

Orthoptera.

FORFICULIDÆ.

Anisolabis moesta, Génè (S.B.).

Forficula decipiens (H.).

„ *pubescens*, Génè (H.).

BLATTIDÆ.

Ectobia albicincta, Br. (S.B.), ♀ ♀ and young.

„ *vittiventris*, Costa, 1 ♂ recently mature.

Loboptera decipiens, Germ. (H. and S.B.), in all stages, and by far the commonest species. All these and the Forficulidæ were found beneath stones.

MANTIDÆ.

Empusa egea, Charp. (H.), ♂ ♂ only and egg-cases; (S.B.) egg-cases only.

Mantis religiosa, L. (H.), young and egg-cases; (S.B.) egg-cases only.

The young *Mantis* and egg-cases of both species were brought home, but the former soon died, and the latter have completely failed to produce either young Mantids or parasites.

PHASMIDÆ.

Bacillus gallicus, Charp. (H.), young only, which fed up well on rose, all, as usual, turning out to be ♀. These only lived a few weeks, but have deposited a fair number of eggs.

GRYLLIDÆ.

Gryllus campestris, L. (H. and S.B.). Abundant everywhere, especially on the margins of cultivated ground. Their presence appeals, both by day and by night, very much more to the ear than to the eye—in fact it was not till we commenced systematically to search for them at Ste Baume that we actually found them at all. But once we had discovered their burrows it was easy to find as many as we required. The ♂ ♂ were much more numerous than the ♀ ♀, or at any rate appeared to be so, and many of the latter, when dug up, were found to be immature. They lived for some time in captivity, ovipositing freely in earth, but we were unsuccessful in rearing the young crickets above about 1 cm. in length.

G. desertus, Pall. (H.), 1 ♀.

G. burdigalensis, Latr. (H.), 1 ♂.

Gryllotalpa gryllotalpa, L. (H.), 1 immature specimen under a stone.

ACRIDIDÆ.

Acridium aegyptium, L. (H.). The ♀ was much more common than the ♂. On seeing this huge insect start from a low bush just in front of one and settle in a cork-oak a few yards away, it was difficult to believe that it was not a bird.

Odonata.

Crocothemis erythraea, Br., *Sympetrum striolatum*, *Aeschna mixta*, *Brachytron hafniense*, *Calopteryx haemorrhoidalis*, *Lestes barbarus*, *Sympyga fusca*, *Pyrrhosoma nymphula*, *Agrion mercuriale*, *A. puella*.

All these were taken on a single day at Hyeres Plage, and that only in the afternoon when our time was getting very short. To British collectors it appeared strange to find *Sympetrum striolatum* and *Aeschna mixta* in mid May; *Sympyga fusca* is well known to hibernate, and the single ♀ found is obviously not freshly emerged. For the identifications I am indebted to Mr. H. Campion.

Neuroptera.

ASCALAPHIDÆ.

Ascalaphus longicornis (H. and S.B.).

A. libelluloides (S.B.).

On this occasion *A. longicornis* was found only at Hyeres, but it was taken by Mr. Main at Ste Baume in July, 1920. A long search for the larvæ under stones at both places (a search encouraged by each of us finding one, and one only), and that in spots where the adults were common, appears to demonstrate that though the larvæ may occasionally be found in these situations such are not their usual haunts. Unfortunately, though one of the larvæ moulted once, we could not get them to feed properly and both died.

MYRMELEONIDÆ.

Myrmeleon formicarius (H. and S.B.), larvæ only.

The well-known pits of these insects were found in plenty in both localities, sometimes on sheltered ledges of rock faces, sometimes on open stretches of sand, even on the sea-shore. It is not certain that these were all of one species, as unfortunately the larvæ were not kept distinct. The only flies to emerge in August were of this species.

Palpares libelluloides (H.). Larvæ only. These were found in some numbers on the landward side of a low ridge of sandhills bordering the sea. They form no pit like *Myrmeleon*, and the only sign of their presence was a few dead beetles and other insects on the sand. On running the hand over the surface of the sand, immediately beneath which they lie, the larvæ, large and small, were easily turned out and discovered. No flies emerged during the summer, and no cocoons were formed, though the larvæ fed well until the autumn. During the winter they have been kept in an unheated room and not fed at all. A few have died, but

most are still (April 2nd) alive though very sluggish. Mr. Main had taken the flies in the Ste Baume neighbourhood in the previous July, but a long search on the few bare sandy patches at that spot failed to produce any more larvæ.

SIALIDÆ.

Sialis fuliginosa (S.B.). A single specimen.

CHRYSOPIDÆ.

Chrysopa vulgaris (S.B.)

C. prasina (H. and S.B.).

Of **Coleoptera** about 300 species were taken—a list far too long to be inserted here. Of these over 180 were taken at Hyères, while only 38 were found common to both places—figures which indicate the strong Mediterranean element in the coastal fauna. Of this total 104 species find a place on the British list.

Particularly interesting were the sea-shore species, the giant *Scarites*, *Pimelia bipunctata*, *Tentyria mucronata*, *Formicomus pedestris*, etc. The flowers of *Cistus* on the hillsides were very prolific, *Bruchidae* being represented by 13 species, *Oedemera* by 7, *Mycterus curculionoides*, various *Dasytids*, *Cetoniids*, etc., while the flowering oaks and pines were sometimes swarming with *Omophlus*; At Ste Baume on the other hand the distinctive feature compared with Hyères was given by those groups with wood-boring larvæ, *e.g.* Longicorns with 11 species as against 7 at Hyères, *Buprestidæ* with 6 species against 2 at Hyères, *Scolytidæ* with 5 species to none at Hyères, and so forth.

For the **Hymenoptera**, to which so much attention was devoted by Fabre, we were too early, though about fifty species were captured, including the fine *Xylocopa violacea* and *X. cyanescens*, while *Chalicodoma muraria* was nidifying in plenty on the walls.

Enough has perhaps been said to give an idea of the possibilities of the district to those of us in search of pastures new. The attractions of collecting on the Continent have long been realised by our lepidopterists (I should perhaps say our rhopalocerists!), but as regards other orders, except for a very limited number of coleopterists, the Continent is indeed to British entomologists a *terra incognita*. Signs, however, are not wanting that interest in the Continental fauna is now waking, thanks chiefly to the English translations of Fabre's accounts of his beloved insects.

A NEW SPECIES OF *EXILLIS*, A GENUS OF ANTHRIBIDÆ (COL.).

By DR. K. JORDAN.

THE Entomologist to the Board of Commissioners of Agriculture and Forestry at Honolulu, D. T. Fullaway, has sent to me for identification a small species of Anthribid belonging to the oriental genus *Exillis*. It is a new species, which can be recognised among the other species (mostly undescribed as yet) by the following particulars:

Exillis lepidus, nov. spec.

Proboscis and head coarsely rugate-reticulate, the former with a short and deep median groove; frons without carinæ. Eye moderately convex. Angle of pronotal carina rounded off. Elytra rather coarsely punctate-striate, with the interstices convex.

Rufescent brown, densely covered with a creamy grey pubescence; no markings below, but the upperside variegated with ill-defined and variable dark brown spots: two on occiput, one in centre of pronotum, and several, more or less confluent and large, on sides of disc, a spot near base of each elytrum, a large one in middle, usually oblique, continued sideways and forming a kind of interrupted band, a patch or a network of spots at the beginning of the apical declivity, and in most specimens a small spot at the apex. Antenna blackish, segments 1, 2 and half 3 like the legs pale rufous, tarsal segments 2 to 4, apex of 1 and extreme tip of tibiæ dark brown.

Length: 2.2-2.5 mm.

A small series of both sexes from Oahu, collected by D. T. Fullaway in July, 1921.

NOTES ON BRITISH ODONATA IN 1921.

By W. J. LUCAS, B.A., F.E.S.

(Continued from p. 127.)

In addition to these notes of my own I have received several interesting communications from other Entomologists who devote some attention to our dragonflies.

K. G. BLAIR reports that from 1-12 July *Ischnura elegans* Vanderl., *Pyrrhosoma nymphula*, Sulz. (with its var. *melanotum*, Selys), were found at the Curragh, Isle of Man. On 28 Aug. *Aeschna grandis*, Linn., and *Ae. cyanea*, Müll., were met with at Stanmore Common, Middx.

F. H. HAINES, writing 18 Aug., says: "I went again yesterday to the Morden pond to try to get some fresh specimens of *Sympetrum fonscolombii*, Selys. As I feared, the insect was over, I had been once or twice at the beginning of this month without success. I would not be quite certain that one specimen did not

present itself, but *S. striolatum*, Charp., had appeared in some numbers to complicate observation as regards at least the females. This latter species was quite absent when I was there in July. So my captures for this season stand at the single male and female quoted in the 'Entomologist.' The females were, if present, elusive. The one secured is redder, and not so teneral-looking as those I took in 1912, 13, and 14. The West Knighton Heath pond has quite dried up, most unfortunately. The Morden pond is very low comparatively, but it is a big one. Yet the nymphs, if present, must have a bad time from the very numerous birds. As regards the non-appearance of *S. fonscolombii* this month, I may point out that every time I have gone the weather has been unfavourable—windy and cloudy, if not rainy, though yesterday was better."

R. SOUTH captured: *Calopteryx splendens*, Harris, at Rickmansworth Canal, Herts, on 1 June; *Calopteryx virgo*, Linn., at Padworth, Berks, from 12–14 June,—one full-coloured male, one male perhaps var. *anceps*, Steph., and one female with rather narrow wings; *Ischnura elegans*, Vanderl., *Pyrrhosoma nymphula*, Sulz., and *Enallagma cyathigerum*, Charp., also at Padworth from 12–14 June.

A. RANDELL JACKSON reports: *Ae. cyanea*, Müll., *A. imperator*, Leach, *C. annulatus*, Latr., *C. aenea*, Linn., *I. depressa*, Linn., *O. caerulescens*, Fabr., *C. virgo*, Linn., *I. elegans*, Vanderl., *A. puella*, Linn., *P. nymphula*, Sulz., and *E. cyathigerum*, Charp., at Ashdown Forest, Sussex, in June. In Delamere, etc., Cheshire, in 1921 early things were numerous, but the later ones—presumably affected by the drought—were rarer than usual. *Leucorrhinia dubia*, Vanderl., and *C. aenea*, Linn. were common in Delamere and he got a few *Erythromma najas*, Hans., in early June. He saw a pair of what he was sure were *Brachytron pratense*, Müll., in a lane near Chester at the end of May. As it would be new to the county list he hopes to get it in 1922. *Agrion pulchellum*, Vanderl., was absent from the place where it occurred in 1920.

F. J. KILLINGTON writes 14 Jan., 1922: The year as a whole has been the most disappointing one for Odonata that I have experienced. Even so I was astonished at the number of imagines that did get through considering that most of our local ponds dried up completely (*i.e.* near Eastleigh, Hants), yet later a fair number of such things as *Ae. cyanea*, Müll., appeared. *A. mercuriale*, Charp., did not occur in abundance but of those taken a fair percentage had aberrant markings on the 2nd segment. I did not notice any imagines after June. *A. puella*, Linn., *A. pulchellum*, Vanderl. (scarce), *P. nymphula*, Sulz., *I. elegans*, Vanderl., *C. virgo*, Linn., and *C. splendens*, Harris, were all in evidence at the beginning of the season, but seemed to disappear quickly. I came across one specimen only of *Lestes*

sponsa, Hans., on a dry pond bed (30 July). *E. cyathigerum*, Charp., swarmed on the open clear sheets of water around Southampton from spring until the end of September. Early in the last named month (1st to 3rd) I took teneral specimens of this species. On 21 May I came across *C. aenea*, Linn., here—a species I had previously overlooked in this neighbourhood."

H. SLATER, writing 18 Sept., 1921, tells me that—Capt. Troup brought him (on 11 July) from Maiden Down near Burlescombe (N. Devon) the only little blue dragonfly he saw. It was *A. mercuriale*, Charp., and a record for Devon. He goes on to say: "He and I worked, a fortnight later, other parts of the Blackdown Hills (where *Orthetrum caeruleum*, Fabr., is endemic, but not found, as far as I know, elsewhere in the county). Again we met with one only little blue, and it was again a male of *A. mercuriale*—this time in Somerset. I expect I shall find it all along the hills, on which are healthy and sphagnum bogs, constituting our boundaries with Devon."

E. A. C. STOWELL informs me that: "Of the less common species the most generally distributed in our woods (*sc.* near Alton) seems to be *C. aenea*, Linn., which I have found in Alice Holt and Binswood (both clay with oak) and Headley Park (sand with fir and birch). I caught *A. imperator*, Leach, at Kingsley pond—an open heath pond with no trees or bushes near. This pond was nearly dry in October and ducks were evidently making havoc of surviving naiads. Both Oakhanger ponds have also gone stone dry. *Pyrhosoma tenellum*, Vill., was taken on 24 Aug. at a pond in Cranmer Bottom, Woolmer Forest. It was not a very bright day, and it was sitting on the vegetation beside the pond, which is a long one with poor pines growing in bog at one side and open heath on the other. The specimen I took was a male. There was no abundance of them, and when I went again in September there were none to be seen. I noted—*C. virgo*, Linn., 14 May, Bentley; *C. aenea*, Linn., *L. depressa*, Linn., and *P. nymphula*, Sulz., on 20 May, the first in fir-wood at Headley Park, the other two at Kingsley; *A. puella*, Linn., *E. cyathigerum*, Charp., *P. nymphula*, Sulz., and *L. quadrimaculata*, Linn., on 22 May at Oakhanger; *A. imperator*, Leach, on 2 July at Kingsley; *P. tenellum*, Vill., *S. scoticum*, Don., *L. sponsa*, Hans., and *E. cyathigerum*, Charp., (the last with strangely aberrant marking on abdomen) on 24 August at Cranmer Bottom.

There seems to be no doubt that the drought affected adversely the dragonflies in the latter part of the season, reducing their numbers and causing their periods to pass by rapidly. Its effect in the present season will be watched with interest by students of our Odonata.

28, Knight's Park,
Kingston-on-Thames;
April, 1922.

COLLECTING IN 1920 IN GLOUCESTERSHIRE,
NORTH WALES, ETC.

BY C. GRANVILLE CLUTTERBUCK, F.E.S.

I was too busy in the spring to do much, added to which Easter in Gloucester was a complete "washout," four days of almost continuous rain rendering field work impossible. My first good day was May 3rd, when in company with Capt. G. H. Simpson-Hayward we found *Crambus chrysonuchellus* on the Cotswolds for the first time, and also larvæ of *Geometra papilionaria* by searching the young birches. The latter were mostly stung but some fine specimens were bred. The afternoon of June 2nd was spent in Leigh Woods with Mr. G. C. Griffiths and Mr. A. E. Hudd. The latter took a specimen of *Phalonia nana* in his Diptera net and kindly gave it to me. Amongst others I secured *Alucita osteodactyla* amongst Golden Rod and *Argyresthia illuminatella* amongst larch, both for the first time. June 13th found me on our hills, when *Lycaena arion* was observed in a new locality which, on the 18th, produced specimens of *Gelechia plantaginella*—a new record for Gloucestershire. They were taken at rest on stones scattered about in a hilly field. The 24th was a fine, warm day, and whilst I was taking *Eretria pinivorana* by beating Scot's firs, two visitors, Capt. Tebb and Mr. J. J. Lister, were taking *L. arion* in yet another locality. The weather during the last week in June and practically the whole of July was most disappointing, villainously cold, wet and windy, and made collecting micros practically impossible. However, on July 9th I realised one of my ambitions by discovering a locality for our rarest local orchid, the Red Helleborine (*Cephalanthra rubra*). The same day *Æcophora lunaris* and *Cedestis farniatella* were observed at rest on a neighbouring fence. Having arranged to visit Towyn in North Wales from July 27th to August 18th, I wrote to Mr. H. Rowland-Brown and Mr. W. Mansbridge for information as to the district, which they kindly supplied. The former said he had supplied specimens of *Papilio machaon* to Dr. Jackson of Aberdoverly to try planting them out and suggested that I should inquire as to the result of the experiment. I learnt from Mr. Jackson that the species entirely failed to establish itself. Going through his collection I noticed a specimen of *Deilephila lineata* (*livornica*), which he had taken locally in May, 1912, at flowers of *Silene maritima*. He also had specimens of *Zephyrus betulae* and *Coenonympha tiphon* taken in the district. He told me that the larvæ of *Cucullia asteris* were to be found on Golden Rod in September on the mountain at the back of his house. Personally I was disappointed with the district. The first week at Towyn was spoilt by the wet and windy weather.

On July 29th I cycled to Talylyn (ten miles), left my machine at a farm house and started to climb Cader Idris (2920 feet). There was a cloud over the peak, but in my inexperience I disregarded it, to my cost. The path leading from the road through a belt of scrub oak was covered with loose pieces of slate, rather trying to one's boots, and beating the oaks only produced *Eucosma arcuella* and *Gracilaria alchimiella* (*swederella*). On emerging from the tree belt I netted a dipteran, which has been kindly identified by Mr. Claude Morley, F.E.S., as *Theriopectes distinguendus*, Verr., and then went through a farm-yard, where the farmer's wife obligingly directed me to the best way up the mountain. On the way up I netted two specimens of *Coenonympha pamphilus* in the hope that they were *C. tiphon*. The west wind from the sea made a net practically useless had there been anything to catch, but only a larva of *Eriogaster rubi* was observed sunning itself on a stone amongst whortleberry. When 2000 feet up I had a glorious view of Snowdonia. A little further on I was swallowed up in the mist but nevertheless proceeded to the summit, where I was just able to look down the precipice into the tarn called Llyn Cau. On the return journey on the roadside at the foot of the mountain I noticed a nest of *Vanessa io* larvæ about three-quarter grown feeding on the nettles. August 2nd being fine we walked to the Bird Rock, a mountain rising 1000 feet sheer out of the valley, the home of the cormorant and other sea birds, but the only species noted worth mentioning was *Endotricha flammealis*. To visit Mr. D. A. Jones, M.Sc., of Harlech, twenty-three miles away, I cycled through Barmouth on the 5th. Just before I came in sight of the picturesque ruins of Harlech Castle a freshly emerged ♂ *Gonodontis elinguaris* was boxed from a telegraph post. *Tephroclystis subfulvata* and *T. nanata* were boxed from a fence near Barmouth. Next day on the way to Owen Glendower's Cave at Tonfanan a burying beetle, *Necrophorus rustator*, was noticed at work on a dead Meadow Pipit. A solitary *Polyommatus icarus* was seen on the sandhills of Aberdoverly on the 7th, and a green bottle fly was found impaled on a spike of marram grass. On the railway bank adjoining the sands of Towyn, where the seaside Everlasting Pea (*Lathyrus maritimus*) was growing, *Hipparchia semele*, *Chrysophanus phlaeas*, *Plemyria galiata*, *Zygæna filipendulae*, *Eucosma cespitana*, *Tortrix conspersana* and *Anacamptis taeniolella* were taken. Other captures included *Opistegia salaciella* (on some iron railings near the shore on the 13th) *Lithocolletis alnifoliella* and *Ochsenheimeria birdella*. My wife found a larva of *Notodonta ziczac* on poplar on the 9th. On the 11th I cycled to Dolgelly. My only capture there was *Scoparia ambigua*. On the 15th *O. birdella* ♂ was observed at rest on a gate-post on the local marshes where *Juncus acutus* was growing, and also a worn pair of *Zygænas in cop.* on flowers

of Ragged Robin, which have been since kindly identified by the late Mr. Rowland-Brown as *Z. trifolii*. We returned home on the 18th.

From larva feeding in purses at the end of osier leaves picked in our beds in September I reared a few specimens of *Gracilaria stigmatella* and its ichneumon, *Angitia virginalis*, Grav. The latter was kindly identified by Mr. Morley. I beat out a ♂ *Exapate congelatella* from a hedge near here for the first time on October 14th. *Tephroclystis pulchellata* began emerging on June 4th, 1921, from pupæ brought from Towyn. In conclusion my thanks are due to Mr. E. Meyrick, F.R.S., for identifying most of the micros.

23, Heathville Road,
Gloucester;
June 10th, 1921.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ. (OXYURA).

By CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 135.)

16. PROCTOTRYPES HYALINIPENNIS, sp. nov.

A black and finely pubescent species; tegulæ, base of flagellum obscurely, and the legs except basally, clear red. Superficially very like the last species, but abundantly distinct in its longer head, short, stout and filiform flagellum, whereof the joints are parallel-sided, and nearly truncate at both extremities, with the seventh to twelfth but slightly longer than broad, the radial appendix is wanting, the metathorax is shorter and apically less attenuate, with its disc less smooth; the abdomen is slightly, and the legs very distinctly shorter, with the terebra very nearly straight. The orbicular head is not at all broader than long in ♀ and but slightly so in ♂, and resembles that of *P. clavipes*, Thoms., but the short metathorax with its finely sculptured disc, and the equally long third and thirteenth antennal joints, render it distinct. In the ♂ the flagellum is more slender than in ♀, though its joints are equally cylindrical and truncate. Length $3\frac{3}{4}$ –5 mm. ♂ ♀.

Types of sexes in author's collection.

Doubtless a winter species, since of my single pair, the female was swept from thistles (*Cnicus palustris*), in marshy ground at Bentley Woods so late in the year as November 16th, 1895, and Mr. W. H. Tuck kindly sent me the male, taken by him during May, 1899, at Tostock, in Suffolk.

17. PROCTOTRYPES MICRURUS, Kieff.

Serphus micrurus, Kieff, in André, Spp. Hym. Eur., x, p. 312.

Hitherto known from only Portugal and France. I am enabled to introduce this species as British on the strength of three females taken by me on October 2nd, from the inside of a dead rabbit at Bentley woods, near Ipswich; another captured with these is now lost. All four were probably no more than sheltering here from the weather, since with them were no insects but the Braconid, *Meteorus filator*, Hal. (cf. 'Entom.', 1908, p. 150), a Lepidopterous parasite.

18. PROCTOTRYPES VIATOR, Hal.

Proctotrupes viator, Hal., L.c., p. 12. ♂ ♀; Voll., L.c., p. 31, pl. xix, fig. 7, ♀. *Serphus viator*, André, L.c., p. 311.

Southern and western Europe from the Crimea to France, from May to September. Common in woods in both Ireland and England, though less frequent than *P. pallidipes* (Haliday and Walker), Scotland (Cameron). We have nothing published respecting its economy but Curtis' two records: he says ('Farm Insects,' p. 198) "that on opening the cells of the specimens of this beetle *Nebria brevicollis*, Fab. I found them partly consumed, and the other had produced six specimens of *P. viator* (?), thus showing that this parasite keeps in check . . . the larvæ of ground beetles." Kieffer omits the query, carefully perpetuated by van Vollenhoven, whom he obviously copies, for he omits Curtis' more certain record from another ground beetle, *Pterostichus vulgaris*, Linn. (*lib. cit.*, p. 131), thus: the larvæ of *Onaseus melanarius* are "frequently infested by a parasite called *P. viator*." It is remarkable that entomologists nowadays ascribe the host to the Staphylinidæ; thus Edward Step sent me four bred in 1909 "from *Creophilus maxillosus*" at Worcester Park in Surrey; K. G. Blair gave me three bred at the end of April, 1913, "from *Ocyopus olens*" larva at Eastbourne in Sussex, and Dr. T. A. Chapman was interested in an "*Ocyopus olens*" larva found at Reigate, in Surrey. I have recorded ('Trans. Entom. Soc.', 1907, p. 9) the occurrence of a similar larva in my Monks Soham garden. A later record is that of a "*Coleopterous* larva" dug up in a garden at Skegby in Notts during July, 1917, whence two imagines emerged the same month. Charles Nicholson, in 1918, met with two instances of "*Coleopterous* larvæ," dug up in a Walthamstow garden, each producing about fifteen of these parasites. It is more than probable that Frohawk's record ('Entom.', 1886, p. 225) also refers to the present species, since *Exallonyx ater* has hitherto been so little understood. *P. viator* is everywhere common, and I have records from Suffolk, Wiltshire, Hampshire, etc., up to Banchory in the Kincardine highlands of Scotland, where Elliott found it not uncommonly.

19. PROCTOTRYPES CHITII, sp. nov.

A shining species with the frons normal, metathorax except basally scabriculous, terebra hooked and a dark spot below the alar stigma; abdomen oblong and apically subtruncate. Similar to *P. viator* in its wings, centrally unicarinate and laterally mutic metathorax, red legs with all onychii nigrescent, deplanate frons and subdistinct discal nervures, but very different in having the radial cell so short as to be hardly distinct from the stigma, head buccate and in ♀ but slightly broader than long, all the coxæ red, disc of metathorax subtriangularly nitidulous to its base with this area weakly circumcarinate, and remainder of metathorax more finely rugulose; second segment basally less compressed with more feeble striæ, terebra longer and stout, strongly arcuate, much longer than metatarsus, and as long as half segment; legs also very much longer, and the hind ones nearly double abdominal length, all the onychii and onyches of ♀ black with the anterior distinctly explanate though simple. Length 5 mm. ♂ ♀.

Types of sexes in author's collection.

The late Arthur John Chitty, M.A., recognised this species as undescribed when working through the genus in 1907, and had distinguished it by a MS. name. It is peculiarly his, since he captured the unique female near his country house at Huntingfield, in Kent, on September 2nd, 1905, and the male in the same district of Faversham on October 8th, 1906. I here do myself the honour of perpetuating the memory of a most brilliant entomologist and intimate friend.

EXALLONYX, Kieffer.

Bull. Soc. Hist. Nat. Metz, xi, 1904, p. 34.

This genus differs from the subgenus *Phænoserphus* of *Proctotrypes* in little but the explanate anterior onychii and their remarkably trifid onyches. Eighteen palæarctic species and some from America were known in 1908.

TABLE OF SPECIES.

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| (16). | 1. | Radial cell at most half length of the normal stigma. |
| (15). | 2. | Second, large abdominal segment basally striate. |
| (8). | 3. | Frons deplanate, not elevated above antennal insertion. |
| (7). | 4. | Metathorax discally smoother; antennæ mainly nigrescent. |
| (6). | 5. | Antennæ of ♀ slender, reaching to abdominal centre. |
| | | 1. <i>longicornis</i> , Nees. |
| (5). | 6. | Antennæ of ♀ stout, not reaching beyond thoracic apex. |
| | | 2. <i>brevicornis</i> , Hal. |
| (4). | 7. | Metathorax reticulate throughout; antennæ flavous. |
| | | 3. <i>xanthocerus</i> , Kieff. |

- (3). 8. Frons prominent, convex or carinate above antennal insertion.
- (10). 9. Wings strongly infumate and nigrescent throughout.
4. *fumipennis*, Kief.
- (9). 10. Wings hyaline or but slightly infumate.
- (12). 11. Terebra quite straight and not discally curved.
5. *niger*, Panz.
- (11). 12. Terebra always distinctly arcuate discally.
- (14). 13. Flagellar joints cylindrical and not crenulate.
6. *ater*, Nees.
- (13). 14. Flagellar joints curved, rendering flagellum crenulate.
7. *ligatus*, Nees.
- (2). 15. Second, large abdominal segment not basally striate.
8. *laeviventris*, Kief.
- (1). 16. Radial cell very nearly as long as the small stigma.
9. *Wasmanni*, Kief.

1. EXALLONYX LONGICORNIS, Nees.

Codrus longicornis, Nees, l.c., p. 358, ♀. *Proctotrupes longicornis*, Hal., l.c., p. 9, ♂ ♀. *Exallonyx longicornis*, André, l.c., p. 335.

France, Germany and Italy. Frequent in England (Walker), northern Ireland and near Edinburgh (Haliday). The commonest species of this subfamily in my Monks Soham garden, running over and resting beneath leaves of lime-trees, doubtless attracted by the honey-dew of the always present aphid, *Pterocallis tilie*, Linn. But we have no hint of its hosts, though I have taken it running over oak-leaves along with the beetle, *Malthinus punctatus*, Fourc., and De la Garde has found it among the muddy leaves in a pond at South Brent in Devon, where "*Hydrotus fuscipes* was the only not purely aquatic species present" so late as September 16th. My dates extend from April 12th, in which month it is not rarely beaten from Scots pine, through the whole summer to August 23rd, though none have been noted in May. Golspie in Scotland (Yerbury); Wymondley in Herts, one in "nest of *Vespa vulgaris*" (Butler); Loudwater in Bucks and Foxhall in Suffolk (Newbery); Ollerton in Sherwood Forest and Nether Langwith in Notts during June (Carr); New Forest (Lyle); Surrey (W. Saunders); Holiday Hill (Elliott) and Wilverley in New Forest; Edwinstow in Notts; Aspull, Brandon, Tuddenham Fen, Bentley Woods on spruce and Bucklesham Heath, in Suffolk.

2. EXALLONYX BREVICORNIS, Hal.

Proctotrupes brevicornis, Hal., l.c., p. 9, ♀ ♂. *Exallonyx brevicornis*, André, p. 337.

Italy (Kieffer). Taken very rarely in the north of Ireland during September (Haliday). I do not possess this species, and

the solitary female I have examined was captured on July 28th, 1917, by Prof. J. W. Carr, at Lambley, near Nottingham.

3. EXALLONYX XANTHOCERUS, Kieff.

Exallonyx xanthocerus, André, Spp. Hym. Europ., x, 1907, p. 332, ♀.

Head transverse, but not twice as broad as long; frons deplanate; mandibles and palpi flavidous. Antennæ unicolorous bright flavous throughout, as long as head and thorax; flagellum of ♀ slender with exactly cylindrical joints, of ♂ somewhat stout and apically attenuate; in both sexes the third joint slightly longer than the stout scape and twice as long as broad, the penultimate half as long again as broad and a little shorter than the apical joint. Thorax nitidulous; pronotum laterally tuberculate; metathorax gradually declived, evenly reticulate to base and longitudinally unicarinate throughout. Abdomen with the ♀ segments three to six brunneous; petiole transverse, and like base of second segment, striate; terebra arcuate and a fourth of second segment, or three-fourths of metatarsis, in length. Legs slender and clear flavous, with only the claws and base of ♂ hind coxæ infuscate; the large hind calcar one-third of the metatarsal length. Wings hyaline, tegulæ flavous; stigma semicircular and double length of radial cell; discal nervures wanting. Length 3.5–4 $\frac{3}{4}$ mm. ♂ ♀.

The male has not before been recognised, and the female was described from Italy. But these insects have been so little worked that it is not very surprising to find this species in southern England; it is doubtless rare with us and cannot extend far north, as it is unknown in Suffolk. I had the good fortune to beat a single male from oak-boughs in the Wilverley Inclosure of the New Forest on July 11th, 1909. The orange antennæ render it extremely conspicuous.

(To be continued.)

NOTES AND OBSERVATIONS.

H. ROWLAND-BROWN: A CORRECTION.—On page 122 of the present volume the statement is made that the late Mr. Rowland-Brown had bequeathed his collections and library to the Entomological Society of London, with remainder to the Hope Museum, Oxford. This statement, for which I was not responsible, although made on the best authority, is incorrect. Mr. Rowland-Brown's bequest is actually as follows: Such books in his library as the Entomological Society of London does not possess sufficient copies of are bequeathed to it; with the remainder of the books and the whole of his collections to the Hope Museum, Oxford.—W. G. SHELDON.

COLIAS CROCEUS (EDUSA) IN SURREY.—While hunting for Odonata to-day I caught a female of *C. croceus*. It is in good condition and was flying over a piece of marshy land.—BARON BONCK, F.E.S.; Springfield, South Godstone, Surrey, June 6th, 1922.

COLIAS CROCEUS IN SURREY.—It may be of interest to record that on June 3rd, at Dorking, I saw seven specimens of *Colias croceus*, four of which were taken, including one ♀ from which a few eggs were obtained.—T. H. L. GROSVENOR; Gloucester Road, Redhill.

PYRAMEIS CARDUI AND COLIAS CROCEUS (EDUSA) ON THE SUSSEX COAST.—On the morning of May 24th several specimens of *Pyrameis cardui* were seen flitting about the flowery banks that border the western parades on the sea-front of this town. On the 25th they were still more commonly met with in the same place, and on this occasion were accompanied by a *Colias croceus*. I had not previously noticed either species in this neighbourhood this year, although an almost daily look-out is kept for anything that may come along, nor have I seen either species there since, but I hear that *P. cardui* turned up about this date in the woods a few miles inland.—ROBERT ADKIN; Eastbourne, June 8th, 1922.

COLIAS CROCEUS, ETC., IN SUSSEX.—I have seen this month *Colias croceus* and a number of *P. cardui*, and also on the 30th I took *Heliothes peltigera*.—J. E. CAMPBELL-TAYLOR; Southdown Villa, St. Anne's Crescent, Lewes, Sussex, May 31st, 1922.

COLIAS CROCEUS AND VANESSA ATALANTA IN THE ISLE OF WIGHT.—Yesterday, May 24th, I saw near Alum Bay in the Isle of Wight a *Colias croceus* flying rapidly over the downs, and during the same afternoon, near the same place, I also saw a *Vanessa atalanta*. The day was warm and sunny with a light air from the south-east. *Euchloe cardamines* was very late in emerging this year in the Bournemouth district, the first noticed by me—a ♂—appearing in my garden on May 20th.—A. L. RAYWARD; Durdells, Kinson, near Bournemouth.

COLIAS CROCEUS IN WILTSHIRE.—Several specimens of this species have been seen here during the last week.—A. P. G. MICHELMORE; Marlborough College, Wilts, June 4th, 1922.

COLIAS CROCEUS IN DEVONSHIRE.—I am able to report the occurrence of this species both in North and South Devon last week, on May 25th. I have not seen either myself nor were the specimens captured, but my informants were in both cases reliable. Are we going to have another "*croceus*" year at last?—MISS HINCHLIFF; Worthington House, Instow, N. Devon, May 28th, 1922.

COLIAS CROCEUS (EDUSA) IN S. DEVON.—It may be interesting to record the appearance of *Colias croceus* along the South Devon coast near the mouth of the Erme on May 22nd, 1922. On this date I took the female form *helice*, and saw one male. From May 22nd to present date I have seen, in the Yealmpton district, 7 others, 2 females and 5 males, all in perfect condition.—S. T. STIDSTON, R.N.; Revelstoke Villa, Torre, Yealmpton.

COLIAS CROCEUS IN CHESHIRE.—On May 28th, within a mile of the city of Chester, a specimen of this insect was captured by Mr. P. G. Nagle, of Chester, who also saw three other specimens on the same day in the same district.—ALFRED NEWSTEAD; Grosvenor Museum, Chester.

MANDUCA ATROPOS IN S. DEVON.—On May 18th, 1922, a worn and damaged specimen of *Manduca atropos* was taken on the foot-board of a local train at Millbay Station, Plymouth. It was sent to me by a student at Plympton Grammar School called Reginald Linton.—S. T. STIDSTON, R.N.; Revelstoke Villa, Torre, Yealmpton.

PHRYXUS LIVORNICA AT MERTON, SURREY.—A specimen of this species was found at rest by a neighbour of mine on May 15th at 9 a.m. and brought me alive on that date.—F. J. COULSON; 17, Bird-hirst Rd., Merton, S.W.

PHRYXUS LIVORNICA IN WARWICK.—A specimen of *Phryxus livornica*, in good condition, was captured in a garden here on Saturday (May 27th); it is now in my possession. It was at mid-day, and the insect was found hovering over some bluebells.—J. R. SLEATH; 2, Swan Street, Warwick.

PHRYXUS LIVORNICA (?) AT CARDIFF.—While weeding in my garden this evening about 9.15 I saw either a striped or silver-striped hawk moth hovering over some iris and stocks quite close to me.—W. E. R. ALLEN; Fairwell, Llandaff, Cardiff, May 20th, 1922.

SUGARING RESULTS IN 1921 AND 1922.—It is interesting to note the difference in results at sugar this year as compared with last year. On the night of June 10th, 1922, I sugared about 30 trees round the garden. At 10.30 p.m. (sun time) the best patch was visited by 106 moths, next best 95, and many had over 70. The bulk were *G. trilinea* and *A. exclamationis*. Also common were *X. monoglypha*, *T. pronuba*, *M. strigilis* and *fasciuncula*. In smaller numbers were *A. corticea*, *segetum* and *puta*, *N. c-nigrum*, *A. nebulosa*, *A. basilinea*, *X. hepatica*, *P. meticulosa*, *R. tenebrosa*, *L. comma*, *A. psi*, and single specimens of *C. or.*, *C. ocularis*, *T. batis* and *A. ligustri*. On June 14th, 1921, the note in my diary reads: "Sugar, nil. Not surprising, as every leaf is covered with honey-dew." Yet in this year, also a dry one, there is no honey-dew, and moths in consequence are swarming to sugar.—H. C. JEDDERE-FISHER; Apsleytown, Dormansland, June 11th, 1922.

THE COCOONS OF TELEA POLYPHEMUS.—The article by Mr. Geo. Griffiths (*antea*, pp. 38-39) was very interesting to me, as for several seasons I have kept numbers of these cocoons, obtained both through rearing the larvæ and by looking for them in the fall, through our long winters and in the spring. The diversity of method in making the cocoons, their outward appearance, the situations in which they are found and the probable explanation of them make careful and extended observations necessary. Not only is there a difference between the usual method of attachment in Canada and in Florida, but there is a type of cocoon prevalent through the Laurentian mountains, about 60 miles to the north of us, entirely different from any that we find about Montreal. We had hoped

to study this further during last summer but the continued hot dry weather was seemingly disastrous to *T. polyphemus*, for not a larva was seen, but in order to learn what others had recorded about this beautiful moth, notes were made of all the articles available to me, so perhaps the following references to cocoon-making may be of interest:

The first note is in Abbot and Smith's 'Nat. Hist. of the Rarer Lepidoptera of Georgia,' p. 93 (1797), in which we read: "It attaches its web to the underside of a leaf, taking care to spin round the stalk of the leaf and part of the twig, by which means the chrysalis is kept from falling off during winter." Fitch—'Third Report, Noxious and other Insects of N.Y.,' No. 181, p. 455, 1856—says: "It sometimes attaches its cocoon partly to the side of a limb, or sometimes with its silken thread draws two or three twigs together sufficiently to tie its cocoon between them, in which case it does not fall to the earth with the fall of the leaves in the autumn, but it is very apt, by remaining exposed in the tree, to be perforated and have its inmate destroyed by woodpeckers." Riley—'Fourth Missouri Report,' p. 126, 1872—"The cocoon . . . generally attached to a leaf or leaves, with which it falls to the ground, though sometimes it is fastened to twigs and therefore remains exposed during the winter to its enemies." Since the article by Grote (1895) referred to, Daggett—'Entom. News,' vol. x, p. 204, 1899—speaks of *T. polyphemus* cocoons in California as "being closely woven the full length of the stem, and including the twigs adjoining, these being permanently attached to the tree" in contra-distinction to those he was familiar with in the East, in which no attempt was made to fasten them to the twigs and which readily fall to the ground. In 'Can. Entom.,' vol. xxxv, p. 110, 1903, Grote refers to having recorded in 'Proc. Am. Philos. Soc.,' vol. xii, p. 401, 1902, "an instance of the spinning of a silken attachment around the stem of the enveloping leaf in the cocoon of *Teia polyphemus*, reminding us of the habit of *Phylosamia cythia* or even perhaps of *Antheraea mylitta*" and then adds that he has found three more examples of this hitherto unnoticed habit. To this Cockle replied ('Can. Entom.,' vol. xxxv, p. 139, 1903) that this was the rule and not the exception at Kaslo, British Columbia, and further, in vol. xxxvi, p. 100, 1904, quotes Denney that in Montreal "in some seasons 19 out of 20 are firmly attached to the twig." Webster ('Can. Entom.,' vol. xxxvi, p. 133, 1904), suggested the possible interrelation of attacks by woodpeckers and the method of attaching cocoons, and in a supplementary note on p. 336 refers to an article by Davis in 'Journ. N.Y. Ent. Soc.,' vol. v, pp. 42-43. Foster ('Can. Entom.,' vol. xxxvi, p. 144, 1904) then records "a cocoon sent from S. Carolina securely fastened to a twig after the manner of *cythia* or *promethea*." For further references to this subject see 'Entom. News,' vol. xvi (1905), p. 275 and p. 333 (Soule), p. 310 (Dyar); (1906), p. 32-33 (Skinner), pp. 33 (Soule), p. 112 (Kuschel), p. 177 (Kunzé), p. 225 (Forbes).

It would appear that Webster was about right in his conclusions ('Can. Entom.,' vol. xxxvi, p. 336) "that these insects do the best they can under existing circumstances."—Ira B. Muir: 55, Aberdeen Ave., Westmount, Quebec, Canada.

CHRYSOPA DORSALIS, BURM., AT OXSHOTT, SURREY.—On July 8th, 1921, I took from a Scots fir at Oxshott a second instar *Chrysopa* larva which was new to me, and, having seen the majority of our British species, I suspected that this might prove to be *C. dorsalis*, although the example in question did not entirely answer Miss E. M. Alderson's description of that species (v. 'E. M. M.,' March, 1911). On June 1st of this year I was so fortunate as to observe the emergence of this insect, and was pleased to find that my expectations proved correct. *C. dorsalis* was first recorded as British in 1900, when it was discovered by the late Mr. Alfred Beaumont at Oxshott. Since then, I believe I am right in saying, it has not been captured in that locality. Near King's Lynn in Norfolk, however, Mr. E. A. Atmore has for some years taken it fairly regularly, and in 1917 Mr. B. S. Harwood recorded several specimens which he took near Colchester, Essex. The species is therefore decidedly uncommon in this country, and this record of its reappearance in its old haunts may be of interest.—C. L. WITCOMBE; Walthamstow, June 6th, 1922.

THE RELATIVE ATTRACTIVENESS OF VARIOUS TYPES OF ELECTRIC LIGHT FOR MOTHS.—Some interesting letters have recently appeared in this Journal anent the attraction and non-attraction of present-day electric street-lamps for moths, and there is a suggestion that the attraction is some kind of electric emanation rather than the actual light vibrations themselves. The writers, however, appear to have left out of consideration that other sources of light are equally attractive to moths and certain other insects as is the electric one. Both oil and gas lamps are powerful attractions, as also is the acetylene light; and even a candle will serve to trap many insects; it therefore seems superfluous to invoke any other kind of ray than the light-ray itself, notwithstanding that the present type of electric light (the gas-filled incandescent filament) seems to attract much fewer moths. I particularise this type of light, as the complaint seems to be against this form, and the Borough Electrical Engineer of Lowestoft informs me that he sees no difference in the attractive power of the old type of arc (the Crompton enclosed arc) and the modern "flame arc." But the filament lamps are certainly less attractive, and this was the case with the old "carbon filament" equally with the present "metallic filament" which has superseded it, and may more than likely be due to the greater intrinsic brilliancy of the "arc" lights. I have collected for twenty-five years at gas and electric lamps and have had some remarkable nights at both. In the year 1901 at Lowestoft I took in one night sixty-four different species of moths at the electric lamps, which were of the "Crompton enclosed arc" type on the top of the standards, with "carbon filaments" on the lower arms, which were lit on the extinction of the upper arms. There was a falling off at once in the "visitors" on this taking place, but as it was about 1 a.m. the lateness of the hour (or perhaps I should say the earliness) may account in some measure for this, though I should also be inclined to say the diminution in brilliancy was certainly a factor. I consider the fact that gas and other forms of illumination being equally attractive as electric, does

away with the suggestion that the attraction is due to electric waves. The suggestion of Mr. Stringer that the antennae of the females might be "transmitters" and those of the males "receivers" is ingenious and imaginative, but it presupposes the power of setting up an electric current in the body of the female, of which there is not the slightest evidence. I have failed with a delicate electro-scope to detect any current emanating from a "calling" female, and with regard to his suggestion of putting the female in a metal box, I have done this with the female of *M. rubi* and males have come to it. The vibration of the wings appears to cause merely an air current, and most likely is simply the result of sexual excitement and has no direct connection with the attraction of the male. One should not lose sight of the fact that this peculiar sense of sexual attraction at a distance is not confined to insects, but exists, as is well known, in other animals. It would, as suggested by Mr. Nicholson, be very instructive and perhaps enlightening to have an analysis of various lights and some direct experiments with them on their relative attractiveness.—J. E. CAMPBELL-TAYLOR; Lewes, Sussex.

THE SALE OF DR. CHAPMAN'S BOOKS: A SEQUEL. In my review of the sale of this library in the April number of the 'Entomologist,' I mentioned that sets of the 'Stett. Ent. Zeit.' and of the 'Annales of the Société Entomologique de France' were sold for £3 each set. I now learn, from a friend, that the identical set of the former has been recently offered to him for £30! and a set of the latter for £150!! Comment is unnecessary! I hope to return to the subject of the present value of old entomological books in this magazine at an early date.—W. G. SHELDON; May 9th, 1922.

PSITHYRUS DISTINCTUS IN KENT.—On June 7th, at Birchwood, I took a ♂ specimen of *Psithyrus distinctus*, this being the first of the species that I have encountered in this locality.—F. HOWARD LANCUM, F.L.S., F.Z.S., F.E.S.; Fernside, Shepherds Lane, Dartford.

COLIAS CROCEUS AT DELAMERE.—A *Colias croceus*, which I think was a female, was seen flying at Delamere on May 28th. On June 4th, also at Delamere, Mr. W. Rutter and myself saw three more, two males and a female var. *helice*, the latter *in cop.* with one of the former.—A. H. THOMPSON; 54, Church Road, Northwich.

RECENT LITERATURE.

The Bulletin of the Hill Museum: A Magazine of Lepidopterology.

Edited by J. J. JOICEY and G. TALBOT. Vol. i, No. 1.
Pp. 200 + 32 plates. London: John Bale, Sons & Danielsson,
Ltd. October, 1921.

Though somewhat belated, it is hoped this notice is not too late to convey to Mr. Joicey and his assistants our congratulations on the appearance, and on the contents, of this new publication. As the title explains, the magazine is devoted entirely to Lepidoptera, and commences with a brief notice of the aims, methods, and previously published results of work undertaken at the Hill Museum. The bulk of the text is occupied by papers contributed by Messrs. Joicey,

Talbot and Prout and Miss Prout, representing the valuable results of Mr. T. A. Barns' expedition through East Central Africa on behalf of the Museum, which adds to science a large number of new and interesting species. The new material obtained from the little-known island of Hainan by Mr. C. T. Bowring is also worked out by Messrs. Joicey and Talbot. Of biological interest is the first article, admirably illustrated, by Mr. Talbot, on "*Euploeinae* forming Mimetic Groups in the Islands of Key, Aru, Tenimber, etc." The information in this paper is the more valuable because the method of collecting was known and the *whole* of the material passed through the writer's hands. The volume is fortunately not spoilt by the lack of an index: a very comprehensive one is included.

We are glad to know that Part 2 of this magazine is already on the way. N. D. R.

Der Insektenkörper und seine Terminologie. By Dr. H. KARNY. Pp. 93. Vienna: A. Pichlers Witwe & Sohn. Price 7 marks.

Dr. H. Karny, Lecturer in Vienna University, but at present engaged in the Zoological Museum, Buitenzorg, Java, has written the above most useful little book on the insect body and its terminology. The book is meant for a help in the identification of insects, and especially for a supplement to the author's '*Tabellen zur Bestimmung einheimischer Insekten.*' It consists of the following parts: (1) The insect body in general; (2) the metamorphosis of insects; (3) a discussion of the several orders; (4) the phylogeny of insects; (5) an explanation of the principal technical terms in alphabetical order—this last part embracing 32 pages.

The book's value is much increased by 45 excellent woodcuts, illustrating mouth-parts, antennæ and venation. It should prove of great use both to beginners and to advanced students, especially to those who wish to make themselves familiar with the terminology employed in German entomological literature. R. H.

Empire Forestry; Journal of the Empire Forestry Association. Vol. i. Pp. 125. London: Macmillan & Co. March, 1922.

This new periodical is intended to be published quarterly with the avowed object of fostering an interest in forestry at home and overseas. We are glad to note this further evidence of the awakening of a conscience in the matter of the preservation and maintenance of our vast forest resources, so wantonly destroyed in the past. It is a question to which entomologists have always been fully alive, and the article by Mr. R. L. Robinson in the present volume ("*Forestry in the Empire*") does little to dispel the gloominess of the outlook. At the end is a useful short bibliography of recent works connected with forestry. Many of our readers should find matter of interest in this publication. N. D. R.

SOCIETIES.

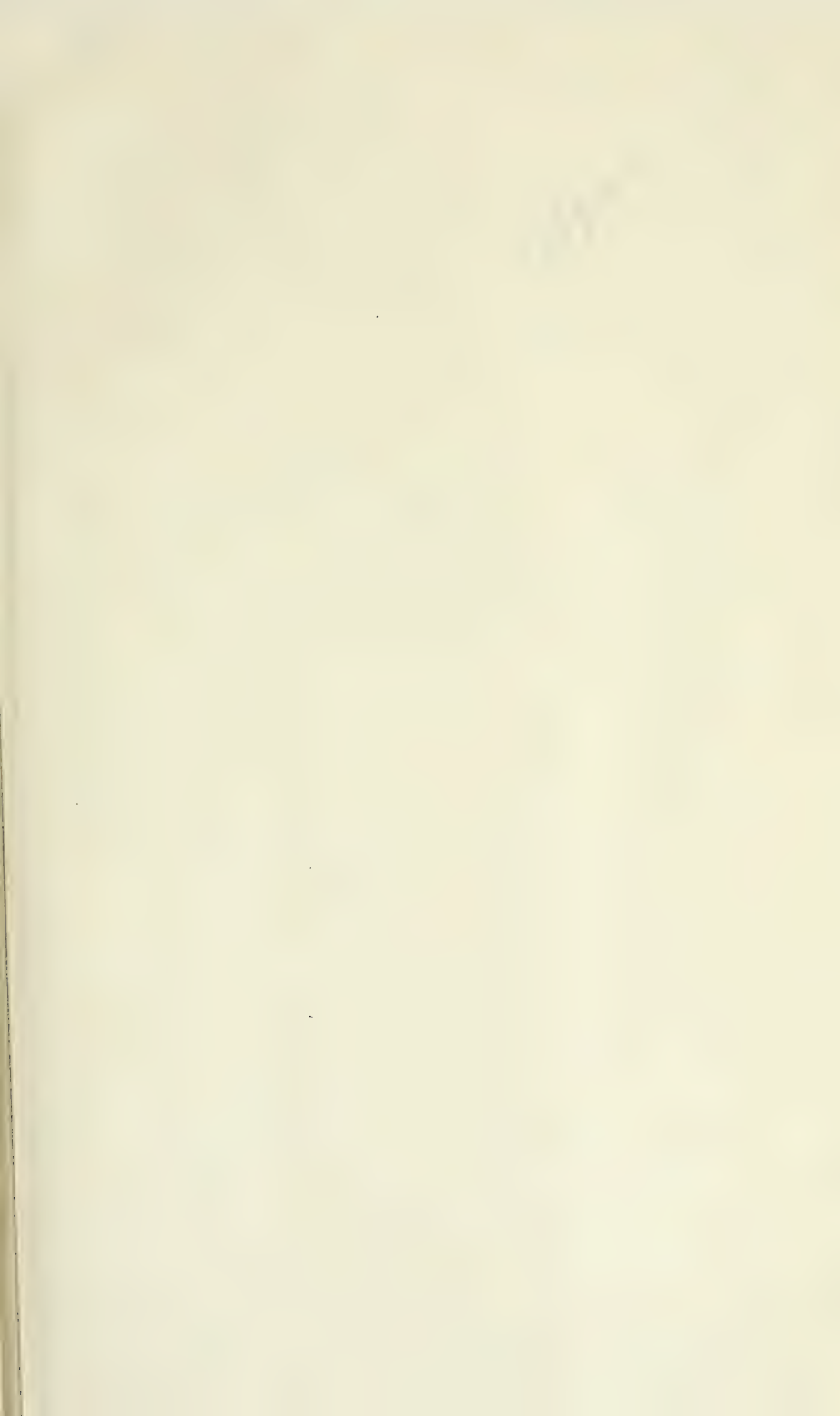
THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, Apr 5th, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., etc., President,

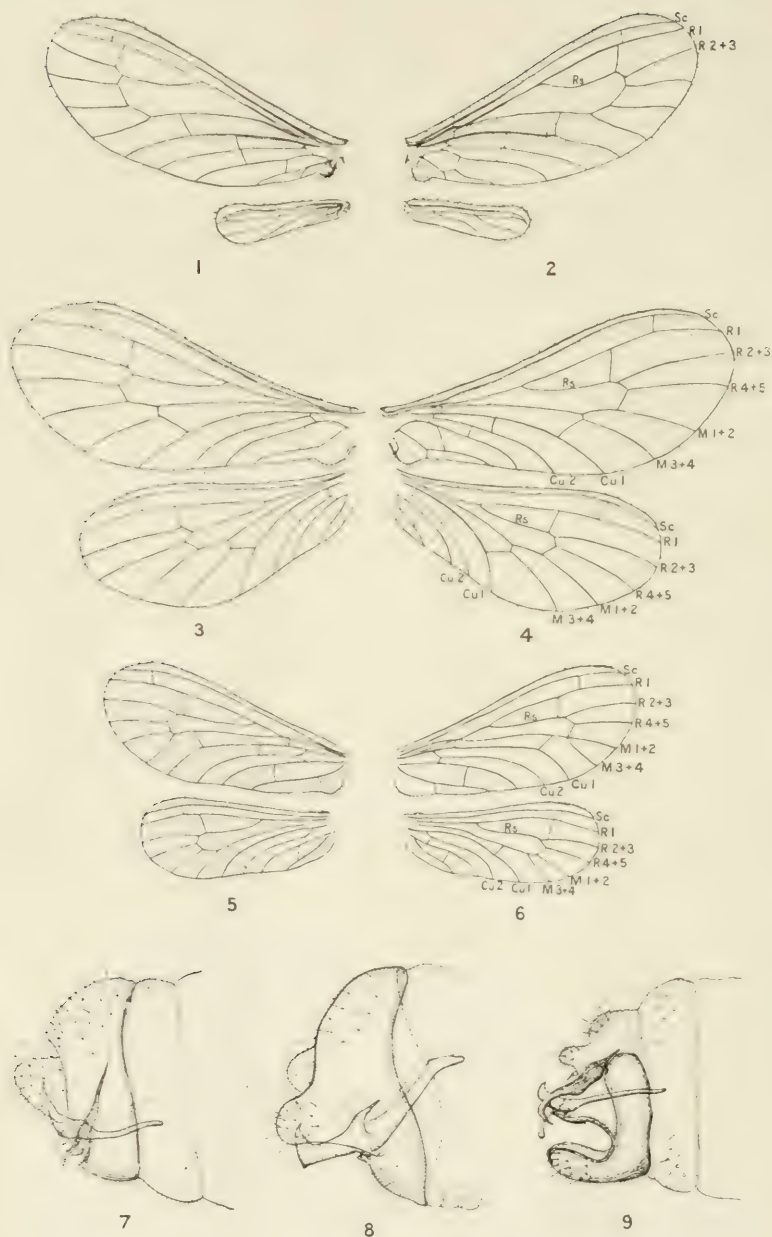
in the Chair.—The following were elected Fellows of the Society: Messrs. William George Clutton, 136, Coal Clough Lane, Burnley; Edmund James Pearce, The Lodge, Corpus Christi College, Cambridge; George Evelyn Hutchinson, Aysthorpe, Newton Road, Cambridge; Charles Herbert Lankester, Cartago, Costa Rica; Arthur D. R. Bacchus, 29, Abbotsford Road, Redland, Bristol; and Captain Douglas S. Wilkinson, Kennington Vicarage, Ashford, Kent.—*Exhibits*: Lord Rothschild exhibited a group of mimetic Lepidoptera and Hymenoptera from South America.—Mr. W. G. Sheldon exhibited, on behalf of Mr. T. Greer, a series of *Epinephile jurtina* and of *Pieris napi* from Co. Tyrone. Mr. A. W. Pickard-Cambridge exhibited Zeller's types of a number of moths, mainly Crambids, from Egypt and Palestine. Mr. W. F. H. Rosenberg exhibited an example of *Colaenis telesiphe titraustes* from Ecuador, in which the band of the hind wing is white as in the typical form.—Mr. G. T. Bethune-Baker exhibited a series of *Heodes phloas*, and a specimen of *Zygæna transalpina* ab. *elongata* from Florence.—Dr. G. A. K. Marshall, on behalf of Mr. B. P. Uvarov, exhibited some remarkable mimetic long-horned grasshoppers with their Cicindelid models.—Dr. J. Jordan, F.R.S., exhibited a pair of the Agaristid moths, *Aegocera mahdi*, the male of which has a stridulatory organ; also a series of *Liphyra brassolis*.—Dr. S. A. Neave gave an account of the fauna of Mt. Mlanje, Nyasaland, and illustrated his remarks with lantern-slides and with an exhibition of some typical insects from that locality.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY. March 23rd, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—The death of Mr. Lachlan Gibb, F.E.S., a life member, was announced.—Mr. Goodman exhibited an aberration of *Argynnis aglaia* with the discal blotches much increased in area and united to form an irregular band.—Mr. Grosvenor, Dr. Chapman's bred series of *Callophrys avis*.—Mr. Turner, the remarkable silver Satyrid *Argyrophorus argenteus* from Chili.

April 13th.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. A. A. W. Buckstone, series of *Brenthis euphrosyne* all strongly marked, taken on high ground at Horsley compared with others taken at a much lower elevation in the valley. Also one from Oxshott with xanthic markings, and ab. *obscura* of *Cleoceris viminalis* from Yorks.—Mr. Enefer, beetles attacking lentils from Egypt.—Mr. Withycombe, the results of pirc-beating at Bagshot, including *Panolis piniperda*, larvæ of *Ellopia prosapiaria*, *Chrysopa vulgaris* and *C. prasina* with its prey *Chermes laricis*.

April 27th.—Mr. K. G. Blair, B.Sc., F.E.S., Vice-President, in the Chair.—Messrs. A. D. Hobson, of Highgate, W. Rait Smith, F.R.S., of Bickley, and A. G. West, of W. Dulwich, were elected members.—Mr. S. S. Green, F.E.S., gave a lecture on "British Coccideæ," with blackboard sketches and numerous coloured figures of species and their depredations.—Mr. Grosvenor, a collection of the species and forms of the genus *Endrosa* (*Setina*).—Mr. Step, a living salamander (*Salamandra maculosa*), which he and his son had found under a heap of stones by the roadside near Boulogne.—HY. J. TURNER, Hon. Editor of Proceedings.





CONIOPTERYGIDE.

WINGS.

MALE GENITALIA.

- | | |
|-------------------------------|------------------------------------|
| 1. <i>C. psociformis</i> . | 4. <i>S. aleurodiformis</i> , var. |
| 2. <i>C. pineticola</i> . | <i>curtisiana</i> . |
| 3. <i>S. aleurodiformis</i> . | 5. <i>P. annae</i> . |
| | 6. <i>P. fuscipennis</i> . |

- | |
|-------------------------------|
| 7. <i>C. psociformis</i> . |
| 8. <i>S. aleurodiformis</i> . |
| 9. <i>P. annae</i> . |

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PARASEMIDALIS ANNÆ, ENDERLEIN, A CONIOPTERYGID NEW TO BRITAIN, WITH NOTES ON SOME OTHER BRITISH CONIOPTERYGIDÆ.

By C. L. WITHYCOMBE, B.Sc., F.E.S.

(Plate II.)

ON June 17th, 1922, when beating Scots fir at Oxshott, I noticed among the numerous *Coniopteryx pygmaea* present, a darker specimen which appeared to me distinct. Closer examination showed this to be a female of *Parasemidalis annae*, Enderlein, a species not hitherto recorded as British. This species was described by Enderlein in 1905 from a single female taken at Berlin, which he distinguished from *P. fuscipennis*, Reuter, mainly on the position of a cross-veinlet in the hind wing. In my specimen this cross-veinlet was correctly placed in the right hind wing for *P. annae*, but in the left hind wing the venation was intermediate between *P. annae* and *P. fuscipennis*. As this kind of variation is very common in the Coniopterygidae, I was anxious to settle the identity of my species. Therefore on June 24th I went again to Oxshott, and secured eight more specimens—two males and six females—by beating the pines.* These were typical *P. annae* or intermediate, but one female had the right hind wing as in *annae*, the left hind wing being as in *fuscipennis*.

Parasemidalis belongs to that tribe of the Coniopteryginae with subequal wings (Coniopterygini of Enderlein), and can be separated from *Coniopteryx* by the forking of the media in the hind wings. Two genera possess a biramous media in the hind wings, *Semidalis* and *Parasemidalis*. In *Semidalis* the cross-vein between fore cubitus Cu_1 and media strikes the latter on the lower arm of fork M_{3+4} in both wings (Fig. 4), while in *Parasemidalis* this cross-vein strikes M on the stem of fork and below fork point (Fig. 6). In the field *Parasemidalis* can at once be recognised by its dark grey colour.

Enderlein, in his "Monograph of the Coniopterygidae," 'Zool. Jahrb.,' 1906, records two European species of *Parasemidalis*—*P. annae*, Enderlein, 1905, and *P. fuscipennis*, Reuter, 1894. The latter may, he says, be distinguished from *P. annae*, End.,

* Since writing, two more specimens have been taken at Oxshott by Mr. W. E. China and four more by myself.

by the termination of the cross-vein between R_1 and R_s , in the hind wing, on R_{2+3} instead of on the stem R_s (Figs. 5 and 6), by the pubescence of the wing, by the red-brown colour of the wing membrane, and by the blacker hind wing.

The position of cross-veins I regard, from my study of this family, as being very liable to variation, and I have already mentioned that one specimen of mine (♀) has one hind wing as in *annae* and the other as in *fuscipennis*. Thus the venational character, on which most stress is laid, is a poor one. As regards the pubescence of the wing I should not like to make a definite statement, but of the two species under consideration I should be inclined to place mine as *fuscipennis* on this character. The pigmentation of the wing membrane is, as a rule, very variable. In *Coniopteryx pygmaea*, End., for instance, some specimens have dark brown or blackish wings, while in others the membrane is almost colourless. This is not due to the age of the specimen. Therefore, although my specimens of *Parasemidalis* have blackish wings and not brown, I do not think much importance can be attached to this distinction. However, since they have in great majority the venation of *P. annae*, I shall provisionally consider them as such until further work shall confirm or disprove.

In all the insects examined, the more strongly chitinated parts of the body, i. e. head and appendages, thoracic sclerites, legs and tip of abdomen are blackish brown; the rest of the body, including wings, dark grey. Antennæ are longer, and somewhat thicker basally, in males than in females. Number of antennal joints in two ♂♂, 31 and 32 respectively. In females the antennæ are 27- to 29-jointed, but one example has the exceptional number of 32 joints. I find no records of a male of either of the two European species of *Parasemidalis* having been taken, and therefore avail myself of this opportunity of figuring the male genitalia (Fig. 9).

The whole body of the insect is covered very sparsely with the waxy powder common to the Coniopterygidae. This powder, it should be stated, is secreted by glands in definitely arranged areas on the body of all Coniopterygidae, and is rubbed over the wings by the insect shortly after emergence. This it does by scraping the abdomen with its hind femora, then rubbing these over and between the two pairs of wings. It is strange that this habit has apparently not been noticed previously, since a very similar proceeding obtains in the Aleurodidae.

The method of pairing is somewhat unusual, and for *Parasemidalis* is as follows: The male approaches the female from behind, and, pushing his head under the wings of the female, seizes her hind coxæ with his jaws. Now he grasps her hind legs with his fore legs, and bending up the tip of his abdomen, pairing is effected. In this way the male is carried about, the female being able to use only her first two pairs of legs for walking.

The pair separated, in each case observed, after about five or ten minutes.

Eggs are laid on pine needles, lying attached by their flat sides. They are .4 mm. long, white in colour, oval, but rather short as compared with the eggs of other Coniopterygids. The micropylar end is drawn upwards and pointed. I shall hope shortly to be able to give further details of the life-history of this species, together with a full account of our other British species.

The Coniopterygidae are well worthy of more attention from entomologists, and present many interesting biological problems. They are semi-gregarious in habits, and where found are usually to be taken in numbers. They fly very little. Variation, especially in wing venation, is common, and as species have been largely named on such characters, the family requires much reinvestigation. Being semi-gregarious in habits, with poor locomotive powers, colonies of a form may be found on one tree differing considerably from another form of the same species found elsewhere. With a view to clearing up some of these points I have been breeding these insects in captivity and studying the forms obtained. *Semidalis* is thought to possess two British species—*S. aleurodifformis*, Steph., and *S. curtisiana*, End. These I find are one and the same, having bred both forms from the eggs of one female. *S. curtisiana* was separated from *S. aleurodifformis* by Enderlein on the position of the cross-vein between R_1 and R_s in both pairs of wings. In *S. aleurodifformis* this cross-vein strikes the radial sector on the upper arm of fork R_{2+3} , whereas in *S. curtisiana* it strikes the stem R_s . In a series of this species—I have examined more than fifty examples—one can observe all stages between the forms *curtisiana* and *aleurodifformis*. The only other character noted by Enderlein is the tarsal ratio, and this I also find variable. The species *curtisiana* was described from females only. I therefore now figure the male genitalia (Fig. 8), which, of course, are identical for both *aleurodifformis* and *curtisiana*. It is highly probable that *Parasemidalis fuscipennis* and *P. annæ* are also one and the same.

Coniopteryx pygmaea, End., and *C. tineiformis*, Curt., are good species, having distinct larvæ. They are, however, liable to variation, and intermediate forms occur which often render determination difficult.

With the genus *Conwentzia* I am still somewhat puzzled. We have two species, *C. psociformis*, Curt., and *C. pineticola*, End. Bagnall brought forward *C. cryptoneuris*, Bagn., as a new species in 1915. This is identical with Enderlein's *C. pineticola*, var. *tetensi*. Bagnall mentions also the lack of pigmentation of the membrane in the outer cells of the wing, but this is quite unreliable as a character and very variable. The remaining species, *C. psociformis* and *C. pineticola*, present many difficulties. They are separated as follows by Enderlein :

Hind wings considerably reduced :

- Cross-vein between R_1 and R_s in fore wing striking the upper arm R_{2+3} of fork. Antennæ 38- to 43-jointed *psociformis*, Curt.
 Cross-vein between R_1 and R_s in fore wing striking the stem R_s of fork. Antennæ 28- to 34-jointed *pineticola*, End.

Both species are of similar habits. I am at present only able to distinguish between the larvæ by the fact that in *C. psociformis* the antennæ are longer, as indeed might have been expected. The male genitalia appear to be the same in both species (Fig. 7). Intermediate forms occur. I have two ♀♀ and one ♂ from Heston, 1921, which have 37-jointed antennæ, and the cross-vein between R_1 and R_s striking the latter at the fork point. These were the only examples of *Conwentzia* taken in this locality, and evidently represent a distinct race. I have a similar but very large and well-marked example from Epping Forest. In breeding experiments I have not yet found a sufficient variation to indicate that the two species *psociformis* and *pineticola* are not distinct. It has been already mentioned that the Coniopterygidae are of semi-colonial habits, and this remark applies especially to *Conwentzia*, in which colonies occur completely isolated from one another when only a short distance actually separates them. Possibly the two species under consideration may have been isolated in this way. Under these circumstances we must for the present leave *Conwentzia* as comprising two forms which, within limits, breed true.

Our British list therefore now comprises seven species :

- Conwentzia psociformis*, Curtis.
 „ *pineticola*, Enderlein.
Coniopteryx tineiformis, Curtis.
 „ *pygmaea*, Enderlein.
Semidalis aleurodiformis, Stephens, and its var. *curtisiana*, End.
Parasemidalis ? fuscipennis, Reuter, and *annae*, Enderlein.
Helicoconis lutea, Wallengren.

The last species was discovered by J. W. H. Harrison in 1915, and recorded in the 'Naturalist,' 1916. He rejected Enderlein's generic name in favour of *Aleuropteryx*, Low. As I have very little experience of this form, I have provisionally retained Enderlein's genus, though it is very possibly, as Harrison says, a poor one.

Walthamstow ;
 July 1st, 1922.

CO-ORDINATED RHYTHM IN INSECTS; WITH A
RECORD OF SOUND PRODUCTION IN
AN APHID.

BY C. B. WILLIAMS, M.A., F.E.S.

THERE are many scattered records of co-ordinated or collective action in insects scattered through entomological literature, which, however, do not seem to have attracted the attention they deserve.

Mass migrations of locusts, butterflies and dragonflies are a form of co-ordinated movement; termites and processionary caterpillars have a "follow-my-leader" habit which is somewhat related, and the up-and-down movement of clouds of midges, other diptera and some may-flies also shows a collective spirit.

Of greater interest are rhythmic actions which are carried out by a number of insects simultaneously and synchronously. Those so far recorded refer to the rhythmic production of light and sound, and it is the purpose of the present note to draw attention to the more interesting of these and to record a new case of rhythmic sound production, which is of particular interest in that it was found in an Aphid, in which family, so far as I am aware, sound production has not yet been recorded.

The existence of synchronised flashing of fire-flies has been the subject of much dispute. My own observations during five years' residence in the West Indies and Tropical America, where both Lampyridæ and Elateridæ are abundant, have so far produced no evidence for it, but in view of the circumstantial accounts from other parts of the world its existence must undoubtedly be admitted.

Severin, as early as 1881 ('Nature,' vol. xxiv, p. 165) writing of an unidentified Indian Lampyrid says: "The curious pulsation or flashing of their light is remarkable, the insects on the tree all act in perfect concert, *i.e.*, five seconds of no light, then seven rapid flashes; five seconds no light, seven flashes; and so the game continues throughout the dark hours." He states also that insects on trees close together keep the same time, but "groups of trees separated by one or two hundred yards may not agree, and do not do so as a rule."

Muir, speaking of fire-flies in Borneo ('Hawaiian Ent. Bull.,' vol. xiii, p. 67) says: "In some places thousands had congregated together and all kept time with the pulsations of their light."

A still more definite account is that given by Hess ('Biol. Bull.,' vol. xxxviii, 1920, p. 39), when he describes *Photinus consanguineus* flashing in concert in a small valley near Ithaca, N.Y. He writes: "For a moment there was a blaze of flashing lights, and then for a moment it was darkness, except for an occasional flash which seemed to come from a different species." This was noticed on two nights, on the second of which Hess found that

they would respond to an electric light if flashed just previous to the time of their normal light. He notes, however, that during five years he had never at any other time seen this co-ordination in *P. consanguineus* or any other species.

Still more recently, O. A. Rheinking ('Science,' May 20th, 1921), describes the synchronised flashing of fire-flies of the genus *Caliphotes* in Siam, where all the insects on one tree flashed together perfectly at regular intervals at a rate of between 105 and 109 flashes per minute.

Other records are quoted in the above and Blair ('Nature,' vol. xvi, 1915, p. 411) says that the phenomenon has been noticed in the European species of *Luciola* and in the genus *Aspidiosoma* in South America.

Turning to the co-ordination of sound production I have only been able to find a very few records. Sharp ('Camb. Nat. Hist. Ins.,' vol. ii, p. 156) gives two of these without references. The first, credited to Forbes, refers to a large brown ant found in Sumatra which produces a tapping noise by striking the leaf with its head. It is a species of the genus *Polyrachis*. The individuals were "spread over a space of perhaps two yards in diameter on the stem, leaves and branches of a great tree which had fallen, and not within sight of each other; yet the tapping was set up at the same moment and stopped at the same instant. After the lapse of a few seconds all recommenced at the same instant. The interval was always of about the same duration, though I did not time it; each ant did not, however, beat synchronously with every other in the congeries nearest to me; there were independent tappings so that a sort of tune was played, each congeries dotting out its own music, yet the beginnings and endings of the musical parties were strictly synchronous."

The second record given by Sharp is that according to a Mr. Peal, an ant, presumably an Assamese species, "makes a concerted noise loud enough to be heard by a human being at twenty to thirty feet distant, the sound being produced by each ant scraping the horny apex of the abdomen three times in succession on the dry crisp leaves of which the nest is usually composed.

In 1900 Gounelle ('Bull. Ent. Soc. France,' 1900, p. 168), describes the sounds produced by a large number of termites tapping with their heads on dried leaves of Bromeliads in Brazil, but the movement is apparently not rhythmic and he describes it as "like a pinch of sand hitting paper." In the same paper he also describes a concerted noise produced by ants of the genus *Camponotus* in rolled-up leaves of bamboo, again by tapping with their heads.

The last record is of the "Snowy Tree Cricket" (*Oecanthus nivicus*) of which Comstock says ('Introduction to Entomology,'

2nd Ed., 1920, p. 93), "All in any locality chirp in unison. Early in the evening, when the chirping first begins, there may be lack of unanimity in keeping time, but this only lasts for a short time—soon all chirp in unison and the monotonous beat of their call is kept on uninterrupted throughout the night. Individual singers will stop to rest, but when they start again they keep time with those that have continued the chorus."

To the accounts above I can now add the following from my own experience. On several occasions during the past few years I have observed a co-ordinated action in a dark-coloured aphid which is common at certain times of the year on the young leaves of cocoa in Trinidad and other parts of Tropical America. The aphid was identified for me by Mr. Theobald as *Toxoptera coffeae*, Nietner, and is apparently distributed throughout the world wherever coffee or cocoa is found.

The aphid sits on the undersides of the leaves of cocoa, almost anywhere on the surface but is usually particularly common along the main veins, and when abundant there may be a hundred or more winged and wingless insects in various stages of growth side by side on the leaf.

When such a colony is disturbed by turning over the leaf to the light or by scraping slightly with the finger nail, a greater or smaller number of the aphids on the leaf set up a regular and rhythmic movement which consists essentially of raising the hind part of the body into the air, keeping the head fixed and the beak still in the leaf tissue.

The raising and lowering movement occupies about one second and it is repeated at intervals of three or four seconds with great regularity, sometimes for twenty or thirty times. If the colony is responsive every aphid on the leaf will be moving in absolute co-ordination and with absolute regularity.

Sometimes two or three separate movements will be set up on one leaf so that all in one section are keeping time with each other, but not with another section, but more usually all on one leaf move together. Individuals quite isolated would keep regular time with the rest.

While observing this closely I found that each movement was accompanied by a distinct scraping sound, audible, with a big colony, as much as eighteen inches away from the leaf and clear enough for me to be able to tell when the aphids were moving without seeing them.

I do not know whether the sound is a deliberate production on the part of the aphid, or whether it is an accidental result of the movement magnified by the leaf surface. I have carefully examined mounted specimens of the aphid with a microscope, but have been unable to find any trace of a stridulating organ.

That the movement is significant and not accidental is shown by the fact that I have observed it on at least a dozen occasions

in localities as widely separated as Panama and Costa Rica in Central America, and in the islands of Grenada and Trinidad in the West Indies, but always, and only, on this one species of aphid.

It has been suggested to me that the movements are protective and designed to ward off parasites, and in this connection it should be noted that on one occasion I observed that the aphids on a leaf that I had not touched were moving rhythmically, and further search disclosed the presence of two syrphid fly grubs moving among them and feeding on the colony. It must also be recollected that the sound, if deliberate, may be awe-inspiring to some small enemy although almost inaudible to our ears.

This whole question of synchronised actions needs much more investigation before a complete understanding is likely to be found. At the same time, it seems likely from the above that we are dealing with extremely rapid responses of a large number of individuals to a single impulse or stimulus. In the case of the fire-flies recorded by Hess this seems the obvious explanation, and in most of the other cases it could also be applied. All the above insects, and many others, normally produce rhythmic actions as individuals, and when large numbers are within range of an original stimulus, the synchronising of the rhythm is natural. In the case where each individual gets its stimulus from the one next to it we would expect a more or less rapid wave from one end of the association to the other. Something of this nature was seen by Hess.

The case of the aphids shows that if two sets of rhythm are in progress at the same time, some individuals will respond to one and some to the other, but none are able to respond to the stimulus from the other section which takes place between their own pulsations and outside their rhythm.

Cairo :

June 9th, 1922.

A NEW FOSSIL LONGICORN BEETLE.

By T. D. A. COCKERELL.

Last year, when at Cambridge University, I was kindly permitted by Prof. Marr to study a collection of Miocene fossils from the famous locality at Eningen in Baden. I wrote a paper on certain fossil beetles in the collection, and sent it to the 'Canadian Entomologist.' Through some mischance it never reached the Editor's hands, and unfortunately the figures are lost and cannot be replaced. There was, however, one very fine new longicorn (Prioninæ), which should be made known.

Ergates atavellus, n. sp.

Length about 25 mm.; entirely piceous; width of head 6 mm., of prothorax 8 mm., length of prothorax nearly 4 mm., its sides hardly convex in profile, exceedingly minutely and briefly denticulate, the only clearly visible denticles being a couple above the anterior femora, not far apart, but there are faint indications of others; antenniferous tubercles large and prominent; antennal joints measuring in mm. (1) 3·7, (2) ·5, (3) 4·9, (4) 4·5, (5) 4, (6) 4, (7) 3·5, (8) 3·5, (9) 3·5; anterior tibiae 5 mm. long; elytra 16·5 mm. long and 5 wide.

Labelled "*Prionus*, Upper Molasse, Eningen (Whidborne Collection)." It is on a slab with about nine *Planorbis declivis*, A. Br.

It agrees with *Ergates* in form, in antennæ, etc., but differs by the almost obsolete denticulation of sides of prothorax, and smaller sizes.

From the American *E. (Trichocnemis) spiculatus*, Lec., it differs by the much shorter third antennal joint, which is about equal to the fourth; in *spiculatus* the third is about 10 mm. and the fourth 3·5 mm. It also seems to lack the distinct ridges on the elytra, or they are very obscure. The elytra also are broadly rounded at the end, without a denticle at the inner corner, so far as can be seen.

In the European *E. faber* (L.), the characters are much more like those of the fossil, both as to elytra and thorax, but in that also the third antennal joint is much longer than the fourth.

Heer figured from Eningen two species of *Ergates*, under the generic name *Prionus*. They are said to have no teeth or serrations at the sides of the thorax.

E. polyphemus (Heer) is said to be very like *E. faber*, and is of the same size. The elytra are 33·5 mm. long, and the third antennal joint is about twice as long as the fourth.

E. spectabilis (Heer) has the elytra 22 mm. long and 5·3 wide, with very distinct longitudinal ridges as in *E. spiculatus*. The thorax is considerably narrower than in our fossil. The antennæ are poorly drawn, but the third joint is considerably longer than fourth, and the antennæ are less attenuate than in ours.

Scudder in 1895 reported a *Prionus*, n. sp., from Eningen, but gave neither description nor name.

The genus *Ergates* is to-day represented by few species, placed in three different subgenera. It appears to represent the remnants of a formerly more extensive group. The related genus *Callipogon* is neotropical.

I also found in the collection, from Eningen, three specimens of *Anoplitis breinii*, Heer. The genus *Anoplitis* is American, and I think Heer's fossil is not congeneric, but falls better in the

Oriental genus *Gonophora*, from which it differs by the short antennæ (beetle about 5·7 mm. long, antennæ about 1·5 mm.). The sides of the thorax, seen from above, are distinctly concave below the median angle, practically as in *G. chalybeata*, Baly. For the present I think the fossil may stand as *Gonophora bremii*.



Danais chrysippus, ab.

SOME CURIOUS ABERRATIONS OF *DANAIS* *CHRYSIPPUS*, L.

BY CAPT. KENNETH J. HAYWARD, F.E.S.

WHILST collecting at Reservoir (near Aswan, Egypt) on January 15th, I took a very curious aberration of *Danais chrysippus*, L., of which an illustration is given above. As will be seen, the left hind wing is toothed at vein 5 in the form of a tail 5 mm. long, below which it curves sharply inwards, resuming the normal shape again at vein 3. The usual white markings in the black marginal border are entirely absent in the hind wings, and only occur as one or two isolated pin-points on the fore wings. The tailed wing has not the usual slightly scalloped edge.

1. *Danais chrysippus*, L., ab. *axantha*, ab. nov.

♂ ♀. Antennæ black. Head, thorax and abdomen black, marked with white as in *chrysippus*. (In some specimens the abdomen above is dark brown, heavily dusted with black.) Fore wings and

hind wings above a uniform dark brown, marked with black and white as in *chrysippus*. *Underside*: *Fore wing* dark brown, the yellow ground-colour showing only in the apical area and at the inner angle, marked as in *chrysippus*: *hind wing* as in *chrysippus*.

Described from 2 ♂♂ and 3 ♀♀ bred at Aswan and in coll. auct., December, January and February.

The above aberration differs from *f. cratippus*, Fldr., in that the dark brown colouring extends evenly over all the upper-side. Beneath it resembles *cratippus*. I have never taken it wild but have bred it not uncommonly from late December till early February, namely during our cold weather. I have bred over 3000 *chrysippus* during the last two and a half years, and invariably found that the cold-weather broods produced a large percentage of dark specimens, sometimes as many as 35 per cent. being the *f. cratippus*, whilst spring and autumn broods seldom produce more than 5 per cent. dark specimens, and summer broods are always lightly coloured.

2. *Danaïs chrysippus*, L., *ab. candidata*, **ab. nov.**

♂. *Antennae* black. *Head* black marked with white as usual. *Eyes* dull dark red. *Thorax* black with a white central stripe. *Abdomen* above ash-grey; beneath light grey; marked with white as in *chrysippus*. *Wings* both above and below of a pale whitish-buff ground-colour, the costal and basal areas of the fore wings grey, the wings having the apical patches and margins black marked with white as in *chrysippus*, the veins light grey.

Described from a male in coll. auct. bred Aswan, Egypt, January, 1922. Probably occurs rarely everywhere amongst typical specimens.

Aswan, Egypt.

THE LIFE-CYCLE OF *PENTHINA SOROCULANA*, ZETT.

By W. G. SHELDON, F.Z.S., F.E.S.

THE life-cycle of this, in certain districts, common species, is very little known, and, so far as I am aware, a reliable description of the larva even does not exist. Barrett speaks of it—"larva hardly described." Dr. Chapman says, "it is a very active green larva, feeding on birch between leaves flatly united, in August, September, and October." Machin says, "it spins up between two united leaves and lies in pupa during the winter." Kennel, 'Pal. Tort.', gives similar short particulars. These details are correct so far as they go, but they do not go very far, and as in June, 1921, at Lochinver in Sutherlandshire I captured a female, she was put up for eggs, with the result that I made the following observations on the early stages:

The ova were deposited on June 29th, singly, on upper and lower sides of leaves of birch.

The following day the ova were pale green, opalescent, and semitransparent, the veins of the leaf showing through the ovum. The length was .9 mm. by .7 mm. As the larva develops in the ovum it shows conspicuously, especially the dark head. The surface is of the usual tortrix pattern, divided into a number of spaces by ridges, irregularly shaped, but with the sides of the spaces consisting of straight lines; the polar axis of the ovum is, of course, horizontal. The larvæ commenced to emerge on July 13th, and the following observations were made on one that hatched on that date.

The newly-emerged larva is about 1.25 mm. long, head brown, lobes prominent, it has a black dot in front of each lobe, the jaws are honey brown; the prothoracic plate is greenish white, the legs and feet black; the segments behind prothorax and claspers are greenish white; there is no sign of anal plate. This larva was put between two birch leaves and kept in an airtight tin box. On July 15th it was eating the lower cuticle of the upper leaf, making small sinkings in it.

On July 23rd the larva had changed into second instar, and was now 2 mm. long; the head was jet black and glabrous, with the lobes not so prominent as in the last instar; the prothoracic plate was dark greenish grey with a wide division between it and the head, in colour light grey; the remaining segments, prolegs and claspers were light greenish grey; the larva was very transparent, the contents of the alimentary canal showing as a reddish-brown line; the tubercles were rather noticeable, and lighter than the surrounding areas; the larva was spiny, the anal plate was not noticeable.

On July 30th the larva had changed into the third instar; it was then 3.5 mm. long; head dark brown and glabrous, lobes prominent; prothoracic plate lighter brown; division between head and prothorax light grey. The prolegs were tipped with black, otherwise the larva was in all respects as in last instar. In this instar the larva fed on the inner cuticle of both leaves.

On August 3rd the larva was in the fourth instar, and measured 6 mm. in length; the head was intensely black and glabrous, the lobes were prominent; the prothoracic plate was light greyish green clouded with darker markings near the rear margin; included in these was a black blotch on each side in the subdorsal area. The larva tapered very much to anal extremity. It was with the above exceptions similar to the last instar in all respects.

On August 10th the larva had changed into fifth and last instar and was then 10 mm. long.

The changed appearance in this instar was very noticeable; the head was light greyish green without any darker markings,

and the lobes were not as prominent as in previous instars; the antennæ were very prominent, although not noticeable previously. The frontal plate was lighter in colour than the head itself, and had two black dots near the centre; there were two other black dots outside the antennæ. The segments behind the prothorax were pea-green in colour; the prothoracic plate was rather lighter pea-green; the alimentary canal showed as a dark green dorsal stripe, and there were two, in appearance similar, subdorsal stripes above the spiracles. I could not see any signs of an anal plate; the tubercles were prominent and light coloured; the spiracles were very small and inconspicuous; the claspers and prolegs were pea-green without any darker shading; the spines were light coloured and of about the average length and number that obtain in larvæ of the Tortrix group. The larva tapered greatly to anal extremity, and rested with head flattened out.

On August 16th the larva had increased in length to 16 mm., when it was full grown. Three days later it had not increased in size; the pea-green colour was deeper, and the stripes were not so prominent. It was evidently commencing to pupate.

In order to pupate, the larva (in confinement) spins together two birch leaves, and forming a silken lining to the pocket so formed pupates therein.

The pupa is 8 mm. long, and measures across the dorsum 1.75 mm. broad. The colour of the wing-cases and head are dull greenish buff, of the abdominal segments dull brown with a slight green tint, darker on the dorsal area, and with the divisions of segments darker; the covering of the head projects slightly in the shape of a bulb, but there is no trace of anything in the nature of a cocoon opener. The antennæ cases project rather prominently from the surrounding portions of the pupa; each of the abdominal segments has two rows of about a score of spikelets, each pointing rearwards. The wing-cases extend to near the rear of the third abdominal segment; the abdomen tapers regularly and gradually from the fourth abdominal to the anal segment, which is bent over towards the ventral surface and is furnished with several hooks which keep the pupa in position in the cocoon. The surface of the pupa is not in any way glaucous.

The imagines emerged in May last.

Youlgreave,
South Croydon;
July 13th, 1922.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 161.)

4. EXALLONYX FUMIPENNIS, Kief.

Exallonyx fumipennis, André, Spp. Hym. Europ., x, p. 339, ♂.

The female of this species differs from the male in nothing but its sexual characters and in having the antennæ stout with the six basal flagellar joints subserrate, and in its greater length of $4\frac{1}{2}$ mm. The typical male form is from Austria and not yet recorded from Britain; the female is here described for the first time.

The British varietal male was taken in England with the ant, *Myrmica scabrinodis*, by Donisthorpe, and subsequently in France by André. But the typical form also occurs here, since Tuck sent me one from Tostock in Suffolk during September, 1900; and both sexes have occurred to me in the same county at Eriswell, where I swept the new female from dry grasses, and at Tuddenham Fen, as well as at Edwinstow in Sherwood Forest, all during August.

5. EXALLONYX NIGER, Panz.

Codrus niger, Panz., Faun. Germ., viii, 1805, p. 85, pl. ix, ♂. *C. pallipes*, var., Nees, l.c., p. 357, ♀ ♂. *Proctotrupes nigra*, Spin., Ins. Lig., 1808, p. 168. *P. niger*, Latr., l.c., 1809, p. 38; Hal., l.c., p. 7, ♂ ♀. *Exallonyx niger*, André, l.c., p. 340.

Var. *PALLIDISTIGMA*, var. nov.—Under this name Chitty had ranged as a distinct species a number of specimens differing slightly from the typical form in having the stigma testaceous and quite remote from the apical abscissa of the radial nervure, leaving the radial cell comparatively broad. It is a good deal rarer than the ordinary form; Piffard has found it at Felden, Saunders at Reigate, Morey at Rookley in the Isle of Wight; I have taken it on the Felixstowe cliffs in Suffolk and swept it at Wicken Fen in Cambs.

Italy, Hungary, Switzerland, Germany, France, Sweden, etc. Not infrequent in woods during autumn; found by Walker and Haliday, presumably in both England and Ireland. Vollenhoven tells us (Pinac., p. 31) that it has been bred from the fungus-gnat, *Brachycampta griseicollis*, Staeg., which occurs in England. This is one of our most abundant species of the subfamily, though very rarely seen on the boulder-clay at Monks Soham and never on honey-dew; it is nearly always

taken by sweeping, usually in shady glades of woods in the afternoon, and I have dates from May 15th pretty continuously to October 5th. Rookley (Morey), Surrey (W. Saunders), Herts (Piffard), Suffolk (Tuck), Cambridge (Lyle), Derby and Notts (Carr), Yorks (Fordham). I have taken it at Newport, Ryde and Norton in the Isle of Wight, Lyndhurst, Wicken Fen, West Leake and Edwinstow in Sherwood, all over the light lands of Suffolk, at Killarney and on Clare Island in Ireland, and Elliott has sent it from Banchory in the Scots highlands.

6. EXALLONYX ATER, Nees.

Coirus ater, Nees, *l.c.*, p. 359, ♂ ♀. *Proctotrupes ater*, Hal., *l.c.*, p. 8; Voll., *l.c.*, p. 28, pl. xix, fig. 4. *Exallonyx filicornis*, Kief., André, *l.c.*, p. 341; *cf.* p. 325, ♂ ♀.

I do not consider Kieffer has satisfactorily demonstrated distinction between this species—which he did not know and places as insufficiently described in his subgenus *Cryptoserphus*, solely upon van Vollenhoven's (often faulty) authority—and that of Haliday, followed by Thomson. Frohawk, in the record noted below, refers to an apterous form of this species, but he does not make it plain whether it were an atrophied imago, like *Proctotrupes curtipennis*, or merely a pupa which had failed to attain maturity.

Germany, where Nees says it infests the larvæ of *Mycetophila* in fungi, particularly Boleti, about which he took it frequently in woods during October, as well as *in copula* on June 19th, 1810; Finnmark and a variety in marine detritus in Heligoland. Ireland (Haliday) and England (Walker). Not very common with us; Olveston in Gloucester (Charbonnier); Ashfield Parva in Suffolk (Elliott); Wymondley in Herts (Butler), West Leake woods in June and September (Carr); Pakefield cliffs on sand and Lowestoft dunes among marram-grass; Brandon staunch, on long grass at Ousden, once at Monks Soham on under-side of lime-leaf at dusk, in Suffolk; and in Guestling wood near Hastings. It is on the wing from June 11th to September 24th. *Cf.* Frohawk's breeding at Eltham in Kent from the larvæ of the rove-beetle, *Creophilus maxillosus*, in the 'Entomologist,' 1886, p. 225.

7. EXALLONYX LIGATUS, Nees.

Codrus ligatus, Nees, *l.c.*, p. 359, ♀. *Proctotrupes ligatus*, Hal., *l.c.*, p. 8, ♂ ♀; Voll., *l.c.*, p. 31, pl. xix, fig. 9, ♀. *Exallonyx ligatus*, André, *l.c.*, p. 344.

From Sweden and France through Spain and Italy to Algeria; common on autumn fungi in woods; Vollenhoven records it from the British fungus-gnat, *Mycetophila punctata*, Mg. Very frequent everywhere; found in rotten seaweed, fungi,

etc., by Haliday and Walker. My dates are May 27th to October 27th, excepting July, by general sweeping and on reeds, on leaves of oak and lime, and house windows; at Foxhall, Hulver, Ipswich, Monks Soham, Wherstead, Bramford, Wangford, Covehithe, South Cove and Southwold in Suffolk. New Forest in May and September (Lyle); Lambley, Southwell and Nuttall in Notts (Carri); Oxshott (Newbery), Reigate (Saunders) and Kew (Sich) in Surrey. That it more likely preys upon some subterranean beetle than upon the above gnats is evidenced by Keys, who bred it at Plymouth in Devon on May 10th, 1909, from a mole's nest.

8. EXALLONYX LAEVIVENTRIS, Kief.

Exallonyx leviventris, André, Spp. Hym. Europ., x, p. 330,

♂ ♀.

England (P. Cameron); Austria (Trieste), Kieffer, *l.c.* I have seen no specimen of this subfamily with smooth second segmental base, though my search has been comprehensive.

9. EXALLONYX WASMANNI, Kief.

Exallonyx Wasmanni, André, Spp. Hym. Europ., x, p. 328,

♂ ♀.

The type form was taken with *Myrmica ruginodis* in Germany, and has not hitherto been known in Britain. The var. *socialis*, Kieff. (*l.c.*), differs in having the legs flavescent, and the radial cell one-third shorter than the stigma. This variety was discovered near London with the ant, *Lasius fuliginosus*, by Donisthorpe during September. The typical form is, however, found with us, for Chitty captured a male in the Faversham district of Kent on May 19th, 1906; but I have no doubt that it is rare, and probably confined to chalky places, since two females alone have fallen to my net, one during the following August at Ringstead Downs in West Norfolk, and the other on August 14th, 1908, as it was flying about the face of the sandy Corton cliff at Lowestoft on the Suffolk coast.

PARACODRUS, Kieffer.

André, Spp. Hym. Europ., x, 1907, p. 273.

This genus has usually been regarded as distinct from the broad genus *Proctotrypes* under the name *Codrus*, Jurine, which was restricted to it by Thomson in 1857; but, since it is really synonymous, the erection of *Paracodrus* must be accepted. The only other species of this genus, *P. albipennis*, Thoms., has been erroneously synonymised with the first, not known as British.

TABLE OF SPECIES.

- (2). 1. *Terebra* distinctly exserted ; radial cell of ♂ short.
 1. *apterogynus*, Hal.
 (1). 2. *Terebra* not exserted ; radial cell of ♂ elongate.
 2. *Bethyliiformis*, Kf.

1. PARACODRUS APTEROGYNUS, Hal.

Proctotrupes apterogynus, Hal, l.c., p. 15, ♂ ♀. *Codrus apterogynus*, Ashm., Bull. U.S. Nat. Mus., 1893, p. 344, pl. xiii, fig. 8. *Paracodrus apterogynus*, André, l.c., p. 276. (?) *Codrus apterogynus*, Voll., l.c., p. 28, pl. xviii, figs. 1 and 2, ♂ ♀.

That the female is sometimes fully winged has not before been noticed ; this form differs in no way but in the thoracic modifications usual in such cases from the commoner apterous form, and the neuration is exactly as in the male, which is by far the rarer sex. I find that I beat a specimen of the macropterous female from bushes in the village of Depden at the very highest point (420 ft.) of Suffolk on September 24th, 1907 ; and that the late Mr. Albert Piffard has given me a second, unnamed, collected by him at Felden, taken upon the top of a dry hill bearing such herbage as *Genista anglica*, etc., above Boxmoor station in Herts ; though an example, labelled by Chitty "*astigmaticalis*, sp. nov.," was found by the latter on September 24th, 1904, in the Sheppy marshes of East Kent—perhaps an inland form, carried in the last instance by the wind.

P. apterogynus was originally discovered by Francis Walker near London and on the south English coast between June and September (Haliday). I have heard of no records later than 1839, and it is still unknown on the Continent. With us the species is distinctly uncommon, and my collection contains hardly a score of specimens captured between July 19th and October 7th ; it is certainly an autumn insect, commonest in August and September. It has usually occurred to me in very marshy situations on *Lythrum salicaria*, by the river Gipping, at Ipswich, in 1898, by the Gipping at Claydon, in a marsh at Ashfield Parva and a moist wood at Wangford, near which it has several times turned up on the coast at Southwold and Easton. Other Suffolk localities are Corton, near Lowestoft, where it was running on bare sand, half way up the face of the cliff in 1898 (Elliott) ; Monks Soham, where it was swept in a pasture containing an old moat in 1909 (Newbery), and the Bentley Woods ; Felden, in Herts, and Hursthill, in the New Forest (Morley) ; Malvern, in Worcester, during 1905 (Gorham) ; and Battle, in Sussex, during August, 1881 (Butler).

Nothing has hitherto appeared respecting its economy. The Irish National Museum in the autumn of 1919 sent me an apterous female of this species for determination, with the intimation that it had recently been bred along with identical

specimens from a larva of the Coleopterous genus *Agriotes*, found at Bangor, in Devon. This is valuable, for it enables us, with some degree of certainty, to ascribe to the present parasite the three old breedings of "*Proctotrypes*" from the same ubiquitous Elaterid genus: (1) William Kirby knew at 'Introd. Entom.,' 7th ed., 1859, p. 154, "the destroyer of the wireworm, which belongs to Latreille's genus *Proctotrupes*"; (2) Curtis, at 'Farm Insects,' p. 159, says the above parasite was from Starston, in Norfolk, and that the host was *Agriotes obscurus*, Linn. He adds, at p. 181, that he himself found two or three white maggots, and another had already pupated from which he could see that it was a *Proctotrypes* species; further, he quotes Bierkander in 'Communic. Bd. Agric.,' vol. iv, p. 414, who had a similar experience; (3) Curtis, at 'Farm Insects,' p. 198, refers to *Proctotrypes*-larvæ, figured at pl. a, fig. 46, protruding from a beetle larva, which he considers to be *Agriotes lineatus*, Linn., found during August, 1841, in Surrey. In a general way I consider that all the more reliable of our records point to the parasitism of the PROCTOTRYPINÆ upon Coleoptera rather than upon Diptera, as was supposed by the older authors. On the other hand, there can be no doubt that Diptera are the staple hosts of our next subfamily, the BELYTINÆ.

2. PARACODRUS BETHYLIFORMIS, Kieff.

The terebral length of this insect appears hardly a specific character; the radial nervure of the present genus is so weak as to be difficult to trace, and Kieffer gives no distinction from *P. albipennis*, Thoms.; moreover, the fact that he did not know *P. apterogynus* renders it far from improbable that all three are no more than forms of a single species. *P. bethyliformis* is simply recorded thus: "England (*P. Cameron*)," by its author.

Monks Soham House, Suffolk;
March 10th.

NOTES AND OBSERVATIONS.

Lycæna adonis in Bucks, and an Appeal.—When at Folkestone in September, 1920, I sent about a gross of living females of *L. adonis* to friends to be liberated in suitable localities on the Oxon, Bucks and Herts Chilterns. The Bucks ground in particular appears to be well suited to the species' requirements, as there it is increasing in numbers with each brood and also spreading. Might I earnestly appeal to collectors not to take the insects, especially the females, before the autumn of 1923, so as to give *adonis* a chance to become firmly established. It seems necessary to make this request as I understand a London entomologist has already been down to Princes Risborough this spring and taken away about 200 specimens. This quantity at a time when the butterfly is endeavouring to secure a footing is a serious matter. I may here mention that *Lycæna*

corydon was again a great rarity in 1921. On the old var. *Syngrapha* ground (where the Royston females were put out in 1920) I saw on various days only about fifty males and not any females, and, of course, no varieties whatever.—G. B. OLIVER; High Wycombe.

COLIAS CROCEUS IN BUCKS.—A fresh male of *C. croceus* was taken on June 1st and a very worn female on the 11th.—G. B. OLIVER.

C. CROCEUS, ETC., IN SUFFOLK.—On June 8th I saw a *C. croceus* flying along a dusty road here (another, or probably the same one, reported same day in neighbourhood). *E. cardamines* were well out here on May 7th and are still flying fresh and strong to-day.—H. W. BAKER; 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk, June 16th, 1922.

COLIAS CROCEUS IN CAMBRIDGESHIRE.—On May 24th I saw two specimens of *C. croceus* near Cambridge and on the following day several specimens in a different locality. This is an early appearance compared with some of the records from the south coast in the July number of the 'Entomologist.'—A. D. TORLESSE (Sub.-Lieut., R.N.); Holywood, Lympington, Hants.

COLIAS CROCEUS IN LINCOLNSHIRE.—I think it may be of interest to record that on June 4th I took two specimens, both females rather worn, of *Colias croceus*; and on June 14th I took a third *croceus*, also a female and rather worn. I netted these three specimens within two miles of my house.—G. T. PIGOTT (Major); Somerby, Barnetby, Lincolnshire.

COLIAS CROCEUS IN S. SHROPSHIRE.—It may be interesting to you to know that on June 5th (Whit-Monday) three specimens of *Colias croceus*, one male and two females, were caught in South Shropshire, one by myself and the other two by my little boy of seven and a half. Also last year and the year before *Vanessa c-album* were very fairly common in this district.—(Rev.) P. MALDEN; The Vicarage, Cleobury Mortimer, Salop.

COLIAS CROCEUS IN WORCESTERSHIRE.—On Sunday, June 4th, whilst out picnicking near Studley, Worcestershire, my son Allan, aged thirteen, wandered off with my net and returned with a female Clouded Yellow, very much worn. Is not this a rather unusual species for the district? Although I fancied I saw one in the same field last year it had escaped my memory. I shall work the district well later on, hoping to find the progeny of this capture.—CHAS. WEARE; Drayton House, King's Heath, Birmingham.

COLIAS CROCEUS IN GLAMORGAN, ETC.—Two specimens of this butterfly were seen in flight at St. Fagan's, near Cardiff, on June 5th. Later in the month (June 11th) four were seen in the same district. Of these three were taken, the insects being males, and all perfect. Just over the county border near St. Mellon's, Monmouthshire, I saw a further specimen in flight on May 27th, 1922. This butterfly was frequently seen in 1901 near Cardiff, but I did not after this see it locally for eleven years. About six specimens were seen in August of 1920 at Sully but none were seen by me last year.—T. J. SHELLEY; 5, Wishwell Road, Cardiff, South Wales.

P. DAPLIDICE AT BRIGHTON.—I write to inform you that on Sunday, June 4th, about 1 p.m., my eldest son caught a Bath White Butterfly (*P. daplidice*) in our front garden, which is in the centre of this town and a few hundred yards from the sea. The fly had settled upon a pansy at the time of its being caught. The insect is in perfect condition and has doubtless not been long out of the pupa. I understand that this fly is one of the rarest in England and is rarely taken in this country. A local amateur collector in this town, Mr. Purbrook, of Upper North Street, has seen the fly and has set it, and confirms the fact that it is a genuine specimen.—B. J. HOLLEYMAN; Sea View House, Crown Street, Brighton.

CELERIO LINEATA LIVORNICA, ESP., IN THE ISLE OF WIGHT.—A ♂ specimen of this Sphingid was taken at Sea View in a crevice of a wall on May 2nd, 1922. The insect was captured by Mr. Bennett, gardener to J. J. Joicey, Esq., in whose collection the specimen now rests.—G. TALBOT; The Hill Museum, Witley.

SPHINX CONVULVULI IN HERTS.—A friend has just shown me a specimen of *Sphinx convolvuli* caught in his garden to-day at rest. The specimen, however, is unfortunately worn. I should also like to mention that, though some insects have appeared late this season, I have some quite early records: *P. rapae*, April 21st; *P. brassicae*, *P. napi*, and *H. malvae*, May 6th; *Phragmotobia fuliginosa*, May 7th—this specimen has very little dark colouring on hind wings; *Spilosoma menthastris*, May 26th—a pair which laid a large number of eggs on May 28th to 30th which have hatched between June 5th and 14th.—R. B. BENSON; Boldre House, Berkhamsted, Herts, June 15th, 1922.

SPHINX CONVULVULI IN CAMBRIDGESHIRE.—I captured a fine specimen (male) of *Sphinx convolvuli* on honeysuckle here on the evening of June 7th last. I believe it has very seldom been taken so early in the year.—A. HAROLD RUSTON; Aylesby House, Chatteris, Cambs.

SPHINX CONVULVULI IN DERBYSHIRE.—You may like to have a note for the 'Entomologist' of the occurrence here of a fine specimen of *Sphinx convolvuli* on the 10th of this month. Records of *convolvuli* in June are not unknown, I am aware, but I fancy they are very scarce, nor do I know quite how they are accounted for.—H. C. HAYWARD; Repton, Derby, June 14th.

HELIOTHIS ARMIGERA IN KENT.—I should like to record that on June 21st I captured near Bexley, Kent, a specimen of *Heliothis armigera*, as it was flying rapidly round a clump of valerian.—M. MACTAGGART; Mooreroft, Gravel Hill, Bexley Heath, Kent, July 3rd, 1922.

CYDIA CITRANA, HB., NEAR WANSTEAD.—Last evening I walked over to a rough field some two miles away to search for *Platylptilia bertrami* amongst a dense growth of Yarrow. I netted a few, but they were all too bleached to be of any use. When on the point of leaving I disturbed a pale-coloured *Tortrix* which I thought was *Phalonia smeathmanniana*. As it was too late for the first brood and rather too early for the second I netted it and was surprised to find that it was *citrana*—a worn male. Directly after I netted another male, also worn. I have never seen it in this district before, and I

think its occurrence so close to London worthy of record.—A. THURNALL, Wanstead; Essex, July 12th, 1922.

NEMOTOIS MINIMELLUS, Z., ETC., IN GLOUCESTERSHIRE.—It may be of interest to record that I took a fine male *Nemotois minimellus* at rest on a flower of Sneezewort (*Achillea pharmitica*) in a field near Gloucester where the Devil's Bit—Scabious (*Scabiosa succisa*)—grows, on August 11th, 1921. On the same date *Lycaena arion* was reported on our hills by Master Russell Brotherton. This was probably a case of retarded emergence and not a second brood.—C. GRANVILLE CLUTTERBUCK, F.E.S., 23, Heathville Road, Gloucester.

LEPIDOPTERA IN THE SWANAGE DISTRICT.—It may be of interest to record the many species of butterflies met with in the Swanage district during the past week-end. The weather was all that could be desired, and the Purbeck hills and valleys were looking glorious in their wealth of summer foliage. The hills running from Ballard Down to Corfe Castle form the ground that gives the best results. Here were found *L. icarus* swarming, a few worn *L. adonis* and males of *A. cardamines*, which were very plentiful, and were flying with a host of *P. brassicae* and *P. rapae*. *A. euphrosyne* were in fine condition, but not abundant; *Z. minima*, *H. malvae* and *T. tages* were very common all along the bottom slopes, and were almost as numerous in the quarry lands to the south. Females of *C. edusa*, *P. atalanta* and *P. cardui* were all ovipositing, and it looks as though these species will be in plenty later. *P. aegeria* and *P. megaera* were very worn but in fair numbers, *C. phlaeas* and *C. pamphilus* were in prime condition, but *L. astrarche* was going over. *C. argiolus* were flying very freely and quite fresh. A new place for *C. rubi* was stumbled upon by accident and they were flitting about in scores. Not a single specimen of *G. rhamni* was met with nor *A. actaeon*, for although the text-books say July, I have generally taken a few of the latter in June. Larvæ of *M. galatea* and *S. semele* were scarce, but *V. urticae* plentiful, and only two *T. quercus* were secured for thirty minutes' beating. Unfortunately time would not allow my visiting the home of *L. sibylla* and *T. fuciformis* where these species occur abundantly but in a restricted area.—LEONARD TATCHELL, F.E.S.; Wanstead, June 15th, 1922.

SPRING RHOPALOCERA IN SURREY.—I thought the following list of species of British Rhopalocera seen or taken between May 19th and June 4th in Surrey within a radius of twenty miles of London would be interesting to readers of the 'Entomologist': *C. argiolus* (common), *P. rapae*, *P. napi*, *P. brassicae*, *E. cardamines*, *G. rhamni*, *V. io*, *V. urticae*, *P. atalanta*, *P. cardui*, *V. polychloros*, *H. malvae* (common), *C. phlaeas* (scarcer than usual), *T. tages* (common), *T. rubi* (local), *N. lucina* (abundant), *L. astrarche*, *L. icarus* (common), *L. bellargus*, *A. euphrosyne* (common), *C. pamphilus* (common), *P. megaera*, *A. sylvanus* and *C. croceus*. I also took a fair series of *P. egeria* from Bucks on May 14th, making a total of twenty-five species in all. The specimen of *C. croceus* is a female in very good condition. I shall be interested to hear if any reader can exceed this total for the same period for the county of Surrey—twenty-four species.—AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, London, S.W. 14.

VARIETIES OF *BRENTHIS EUPHROSYNÉ* AND *THECLA W-ALBUM*.—I should like to record some remarkable colour varieties of butterflies from the Chilterns. In 1920, in a certain wood, I secured a specimen of *Brenthis euphrosyne* having the underside of a deep, almost uniform russet, with dull leaden instead of silvery metallic spotting; also three other specimens of tints ranging back to the type. This year, from about twenty bred specimens, one has emerged of this same form, whilst the wild captures include another, very extreme, two intermediate forms and two with creamy undersides. Strangely enough in all these specimens the uppersides are nearly or quite typical. The first *euphrosyne* seen in 1921, in a small copse some few miles from the wood above alluded to, is probably the strangest specimen of them all. The whole insect, upper and underside, is toned a purplish-mahogany colour, the border metallic spots being magenta-tinted and small. A specimen secured this year has the upperside somewhat similar with typical underside; another has a dull tawny upperside with underside of an olive-grey tint. All these varieties are males. In 1919 I beat five full-fed larvæ of *Thecla w-album* close to High Wycombe which produced the same number of butterflies, one of which I think must be unique. Its colour, both upper and underside, is golden khaki, rather similar to the khaki form of *Lycaena corydon* (✓) occurring at times at Royston and elsewhere. Other less important varieties met with are pale *C. pamphilus* and golden *H. linea*.—G. B. OLIVER; High Wycombe, June 15th, 1922.

C. PHLEAS, VAR.—On May 28th last, when taking Lepidoptera at Horsley, Surrey, I netted a rather unusual specimen of *C. phleas*. The fore wings are a bright golden colour, deeper at the base and gradually getting to a paler shade towards the margins, the hind wings as in typical specimens, but with row of blue spots as in var. *caeruleo-punctata*. The specimen, which is a perfectly fresh one, is still paler in colour when looked at at an angle, being distinctly primrose in shade. I have never seen a specimen exactly like it before: the pale golden specimens I have seen have had the band in the hind wings also of that colour, which is not the case with this specimen.—AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

HYBRIDISATION IN NATURE.—On June 10th, in a marshy field, I took at rest on a grass stem a pair of moths. The female was *Z. trifoli*, newly emerged, and the male was *A. statice* in somewhat worn condition. They remained "*in cop*" for about half an hour only, the female being rather restless. Up to the time of writing no eggs have been laid. *A. statice* was this year fully a fortnight earlier than *Z. trifoli*, which is only just beginning in this particular field. The observation seems interesting as affording evidence of the close relationship between the two families.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

CANNIBALISM AMONG *CUCULLIA VERBASCI*.—On June 23rd I found some of the larvæ of *Cucullia verbasci* on a plant of great mullein. I placed them in a zinc larva cage, and gave them a good supply of the leaves of mullein. On the following day one of them was seen

to attack another with wide open mandibles, and on reaching it killed and devoured it. The same thing happened with another brood of the same. The remainder of the first lot pupated on July 8th and 9th; those of the second are still feeding but will soon, I think, spin up. Has cannibalism been known to occur before with this species?—L. H. BOND; The Cottage, Welby Gardens, Grantham, July 13th, 1922.

A NOTE ON *HELICONISA PAGENSTECHERI* (SATURNIDÆ).—(Extracted from letters from F. B. Hinchliff, Estancia "Los Flamencos," Sancti Spiritu, F.C.C.A. Argentina. March 1st, 1922.) "For the last thirty years I have occasionally seen what I always thought was a kind of *apollo* owing to its flight and transparency of wings. I have seen three or four specimens *only*. The flight is a floppy and irregular one—something like a big white or swallowtail, a distinct *butterfly* flight—and they very rarely alight. I only saw two alight—wings closed like a moth (*Noctua*), the female with wings closed like a 'drinker' moth. They only fly by day for a short period. I found them at the best between 2 and 4 p.m., and when I rode up to the house to get some more papers and got back to the hunting-grounds at 4.45 they had all gone to roost. I could have sworn when I saw them on the wing that they were butterflies, and was quite nonplussed when I saw them on the grass with wings posed like moths. I caught one female and one male in the act of mating—otherwise I should never have believed that they were male and female. An interesting feature about these Argentine specimens is that *to-day* once the moth settled in the dead grass it was impossible to put it up again, evidently it crawled down into the masses of dead grass and there it roosted until the next afternoon. The grasses where I caught it were about 3 to 4 ft. deep. The males settled very occasionally on the dead grass, which, being straw colour, acted as a good 'camouflage,' and once they pitched they were not to be put up again. I marked one specimen down and never put him up, and to find him was like looking for a needle in a bundle of hay. Although the males fly with a floppy flight they go very quickly—though apparently lazily. Having discovered their breeding-ground (they feed on coarse grass about 3 to 4 ft. high) I can catch any quantity next year if required.—This afternoon, 3 p.m. there must have been 300 to 400 males on the wing in 20 acres of pasture, and having noted the date I will be ready for them next year. Personally I should never have thought that the butterfly-looking specimens were moths, as in the sun they looked as if their wings were made of silver, or glass, or celluloid, and the sun shining on the wings made them flash. The caterpillars evidently feed on grass, and I shall keep that island [on which the moth occurred] as a sanctuary of the moth. I found it useless running or trying to run after them in the tall growth so I simply waited until one flew near me, when I made a dash at it. Of course I missed quantities, as they are very quick and dodging, and I only had the small folding net you sent me. The female never attempted to fly—too heavy in body."

In a letter dated April 18th, 1922, he writes: "I wonder what they (these moths) feed on, as they never *once* pitched on a flower, though there were lots of big thistles in full bloom all over the place.

I think it must have been the females that I saw several times flying low and fast over the lake, every now and then dropping on to the surface, like a swallow, and having a drink. It was a dark brown moth about the same size as the one I sent you, and close to the spot on the lake where I saw two or three moths drop on to the surface for a drink, and then off again—very quick flyers."

In a further letter dated June 11th, Mr. Hinchliff writes:—"Re my remark that I had discovered their breeding-ground, what I meant was that I had discovered the locality where they evidently bred, as it is the only spot where there were several of them flying about; before, I had only seen single isolated specimens flying over the pampas, but here, on this island, there were some hundreds flying over a given spot about twenty acres or so in extent composed wholly of coarse grass about three feet high (tussocks, called red grass or *paja colorada*), a few plants of pampas grass with the tall white bloom stalks, some tall thistles, and a few small weeds and a variety of small grasses, including a brome grass the same in appearance as the grass on the sand-dunes at Branton Lighthouse. There were no shrubs or reeds or trees of any kind and they only hovered over the red grass—so-called because in the winter the old leaves turn a reddish colour sometimes. The whole place is two feet deep with dried, rotted leaves of this grass, and occasionally they seemed to disappear mysteriously into it, as the one I caught was in it, and the female was also on a dry blade of the same grass. There is a kind of loosestrife in this country and perhaps there may be some plants there, but next season I will look out for the caterpillars on all the different weeds I can find. Anyhow, I will make a point of trying to find them and will do as you request, taking a careful note and drawing of them in the event of being successful."—G. F. MATHEW; Lee House, Dovercourt, Essex.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*May 11th, 1922.*—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. C. B. Leechman, of Purley, was elected a member.—Mr. H. Main exhibited *Thais polyxena*, bred, from Hyères, and some wingless sand-beetles—*Pimelia angulata*—from Egypt.—Mr. E. Step, a large gall on *Populus alba* from France, with small Diptera (*Cecidomyia*, sp.), which had emerged, and much smaller hymenopterous inquilines. He also showed larvæ of the lichen-feeding Geometer, *Cleora lichenaria*.—Mr. H. Moore, Lepidoptera from New Zealand, including *Vanessa gonerilla*, *Chrysophanus salustius*, etc.—Mr. R. Adkin exhibited the "brown-tail" and "gold-tail" moths, discussed their names, pointing out that the former should be called *Nygma phaeorrhoea* and the latter *Leucoma chrysorrhoea*.—Mr. Staniland, the beetle *Melanophila acuminata* from Suffolk.—Mr. Blair, for Mr. Dods, the "stick-insect," *Baurosius morusus*, of an unusual red-brown colour.—Mr. Turner, the Brazilian Longicorn *Phoenicocerus dejeanii*, which has the antennæ furnished with extraordinarily long lamellæ.—HY. J. TURNER, Hon. Editor of *Proceedings*.

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ON THE IDENTITY OF *SYMPHEROBIUS* (*HEMEROBIUS*) *ELEGANS*, STEPHENS (NEUROPTERA).

BY C. L. WITHYCOMBE, B.Sc., F.E.S.

IN the 'Entomologist' for August, 1914, Mr. K. J. Morton dealt with two species of *Symphorobius* which had been for some time mixed in British collections under the name of *elegans*, Stephens. One of these is smaller than the other and has whitish interruptions on the dark brown veins in the fore wings, while the other and larger species has the fore-wing venation uniformly dark brown. MacLachlan, in his "Monograph of the British Neuroptera Planipennia" ('Trans. Ent. Soc. Lond.,' 1868), gave an account of the species with the white dotted veins, but attributed to it the name of *elegans*, Steph., although Stephens's description plainly refers to the anterior wings as being wholly dark fuscous. MacLachlan makes no comment on this discrepancy between the original description and his own, although it is to be assumed that Stephens's description and type were both known to him.

With the object of determining the proper application of the name *elegans*, Mr. Morton sent to Mr. Herbert Champion specimens of both the species of *Symphorobius* in question, for comparison with the type material in the Stephens Collection at the British Museum (Natural History). Mr. Champion was of opinion that the larger and darker species was the true *elegans* of Stephens, but said he preferred to await confirmation of his identification by someone who had made a special study of the group, before alleging against MacLachlan so strange an error as had seemingly been committed. In the circumstances, therefore, Mr. Morton decided provisionally to retain for the smaller variegated species the name *elegans*, Stephens, while employing the name *striatellus*, Klapálek, for the larger and uniformly dark species.

A short time ago, whilst working through Stephens's Collection at the British Museum, I found to my surprise that the *elegans* of Stephens was undoubtedly the wholly dark species, that is, *striatellus*, Klap. Stephens's Collection contains no representative of the white-dotted form, and therefore there can have been no confusion of types. His type of *elegans* agrees

with his description entirely, and is clearly not the species regarded by MacLachlan as *elegans*. *S. elegans* of Stephens is the larger form, with the veins entirely dark fuscous, as stated in his description ('Ill. Brit. Ent.,' Mand. vi, p. 113, 1836), and is therefore synonymous with *striatellus*, Klap. Other specimens of the same species were labelled by Stephens as *marshami* and *beckwithii* respectively.

Having determined the larger species as *elegans*, Steph., it is now necessary to find a name for the smaller form, and I think we shall be safe in accepting Morton's suggestion and adopting the designation of *S. pygmaeus*, Rambur. Rambur's description ('Ins. Névropt.,' p. 442, 1842) leaves the species somewhat ill-defined, but Brauer's later diagnosis ('Neuropt. Austr.,' p. 56, 1857) admits of no doubt, at all events, as to his conception of Rambur's species.

The following comparison is adapted from Morton, and amply serves to separate the two species under consideration :

Face dark shining piceous; dorsum of thorax also dark pitchy brown; neuration of fore wings entirely fuscous without pale interruptions, these wings heavily marked to the wing base, the markings more or less radiate, especially those proximal to the middle series of gradate veinlets, those in the distal part of the wing much broken up into irregular dots; gradate veinlets usually heavily shaded. Larger darker species.

elegans, Stephens (= *striatellus*, Klap.).

Face and dorsum of thorax yellowish; neuration of fore wings with pale dotted interruptions; dark markings on outer half of fore wings mostly placed opposite each other on either side of the dark portions of the longitudinal veins. A pale space at the base of these wings in which the veins are rather indistinct, the transverse veinlets being hardly visible. Paler smaller species.

pygmaeus, Rambur.

ON THE EARLIER STAGES OF *CACOECIA CRATAEGANA*, HÜBN.

By W. G. SHELDON, F.Z.S., F.E.S.

In the month of June, 1917, searching for larvæ and pupæ of *Peronea boscana* on elm at Brockenhurst, I found a pupa spun up in an elm leaf which produced a male specimen of *Cacoecia crataegana*, generally supposed to be attached to oak. Three years later, at the same period of the year, I beat out of elm at Brockenhurst several very large, dark olive green, almost

black, tortrix larvæ, which I did not recognise, and from them had the following month imagines of *C. crataegana*.

The larva being now recognised I made an excursion to the New Forest in June, 1921, to secure a supply, which I obtained from oak, elm and sallow.

This larva is not readily to be mistaken for that of any other species; the only one resembling it in any way is *C. sorbiana*, but this latter is an earlier larva, being usually full grown when that of *C. crataegana* is only about half its eventual size; in addition the full-grown larva of *C. sorbiana* is much lighter olive green, and has a brown prothoracic plate. It is admirably figured by Snellen in 'Nederlandsche Insecten,' vol. iv, pl. xlvi, figs. 1-3.

The following is a description of *C. crataegana* in the final instar: Head and prothoracic plate black and glabrous without the conspicuous white collar which is a prominent feature in *C. sorbiana*, although a narrow one is discerned when the head is bent downwards. The segments at the rear of the prothorax are in colour very dark olive green, almost black (quite black in the previous instars) and somewhat spiny. The tubercles are rather prominent and black in colour; the larva is somewhat transparent, the alimentary canal being discernible. The anal plate is very black and chitinous, with a rough surface; the prolegs are intensely black; the claspers and ventral area are of a lighter olive green than the dorsal area. The larva tapers towards head and anal extremity; it rests with the head flattened out.

The male pupa is 9.5 mm. long by 3 mm. broad, the female pupa being 13 mm. long by 4.5 mm. broad. The head is blunt and rounded, without a cocoon opener. The wing cases are black and glabrous, striated longitudinally, the head, antennæ and eye covers are prominent and raised. The abdominal segments are very dark brown, almost black, not glabrous; the wing-cases reach to the rear of the second abdominal segment. The pupa terminates anally in a long-drawn-out point which has at the extreme end four hooks, and at the base of the anal segment four others arranged in pairs. Each abdominal segment is armed with rows of spikelets and a number of long spines, two pointing rearwards; the abdominal segments are reticulated on the surface.

Youlgreave,
South Croydon;
July 31st, 1922.

[We very deeply regret to have to announce the death, on Sunday, August 27th, of Dr. DAVID SHARP.]

A NEW *CALLIMORPHA* FROM NORTH-WEST PERSIA AND ARMENIA.

By W. H. T. TAMS.

Callimorpha quadripunctaria splendidior, subsp. nov.

Callimorpha quadripunctaria (Poda), Watkins and Buxton, Journ. Bombay Nat. Hist. Soc., xxviii, p. 178 (1921).

♂ and ♀. General pattern and colour scheme as in *quadripunctaria quadripunctaria*, Poda, than which it is somewhat larger. Palpi: 1st and 2nd segments pale yellow, the 2nd with a blackish spot outwardly near base; 3rd blackish. Antennæ sepia. Head pale yellow, with two black spots on vertex behind antennæ. Patagia and tegulae bright bronze green edged with yellow. Thorax pale yellow with a median longitudinal bronze green stripe. Abdomen rosaceous orange above, with a small black spot on each segment. (Black spots sometimes absent, as in holotype ♂.) Pectus and underside of abdomen pale yellow, the latter bearing a row of black spots on each side, and a median longitudinal row. Fore and middle legs pale yellow, the tibiae and tarsi with sepia bands above. The hind legs pale yellow. Fore wing with the pattern of *quadripunctaria*, from which it differs as follows: Colour brilliant bronze green, with the pale yellow bars more ample: a small pale yellow spot on vein 2, near middle: a pale yellow streak along the basal two-thirds of the anal vein, broad basally, its attenuated extremity joined to the broad pale yellow border of the inner margin. Fringe alternately sepia and pale yellow from apex to two-thirds; remaining third pale yellow. Hind wing and whole of underside as in *quadripunctaria*, but with blackish markings reduced.

Holotype ♂ and allotype ♀: Harir (5300 ft.), N.W. Persia, 11.8. '18 (H. D. Peile).

Paratypes: 4 ♀ ♀, Harir (5300 ft.), N.W. Persia, 10-11.8. '18 (H. D. Peile). ♂ and ♀, Karind Gorge (6000 ft.), N.W. Persia, 14.7. '18 (Peile). 4 ♂ ♂ and ♀, Mungerrah Mts., near Dizful, Persia, 1856 (W. K. Loftus). 2 ♂ ♂ and ♀, Suwara (4000-4600 ft.), 60 miles north of Mosul, Armenia (Capt. Aldworth).

The above specimens are all that I have so far seen, and are in the collection at the British Museum (Natural History).

Col. H. D. Peile says: "July 13th to August 19th, 1918. In large numbers settled on leaves of trees a few feet from the ground, easy to catch; August 10th, abundant still, but more females; 19th August, nearly over."

This very distinct form is in its outstanding features quite constant throughout the series of 16 specimens. It is easily distinguished from *quadripunctaria*, Poda, by its bright bronze green colour, larger size, and by the very long pale yellow streak on the anal vein of the fore wing.

It will be interesting to discover its western limits, as *quadripunctaria quadripunctaria* occurs in Syria. There is a specimen in the National Collection from the Amanus Mts., near Alexandretta, and the Armenian specimens of *splendidior* were taken 600 miles due east of this, beyond the Tigris.

Brit. Mus. (Nat. Hist.),
S. Kensington.

ON A NEW SPECIES OF GENUS *CALPE* FROM JAPAN.

BY A. E. WILEMAN.

IN the National Collection of the British Museum (Natural History) there are three specimens of a new *Calpe* which have hitherto been included in the series of *Calpe minuticornis*, Guenée, but have now been separated and are unnamed, one male from Chang-yang, West China (A. E. Pratt, July, 1888), and two females labelled "Hakodate" and "Yezo" (Andrews) respectively. Hakodate, I may state, is situated in the Island of Yezo, now more commonly referred to by Japanese as Hokkaidō, so that both these Japanese specimens hail from Hokkaidō, or Yezo. In the same series there is also exhibited an inflated larva of *minuticornis* (ex Green Collection, Ceylon), coloured figures of the larva and pupa drawn by Moore, and a preserved pupa shell from the Moore Collection. Moore also figures and describes the larva and pupa of *minuticornis* in 'Lepidoptera of Ceylon,' vol. iii, p. 78, pl. cliii, fig. 3, imago; fig. 3a, larva; fig. unnumbered, of pupa, 1884-7.

I have in my Japanese collection four specimens of this new *Calpe*, which agree well with the above-named three specimens of the British Museum series, namely, two males bred at Hakodate, Hokkaidō, on August 6th and 7th, 1902; one male bred at Hakodate probably about the same time as the two preceding males; and one female received at Hakodate in 1902 from the Right Rev. Bishop Andrews, Bishop of Hokkaidō, taken by him in Hokkaidō, but neither dated nor localised. One of these four specimens was bred from a larva painted by a Japanese artist on July 8th, 1902, whom I employed at Hakodate for the purpose of figuring the larvæ of various Japanese Lepidoptera. This drawing differs altogether from the coloration and markings of the larva of *minuticornis*, Guenée, as exhibited in the series of that species in the British Museum Collection, and as described and figured by Moore in his 'Lepidoptera of Ceylon.' Moreover, a critical comparison of the series of *minuticornis* in the British

Museum Collection, which includes Guenée's female type, with the series of this new *Calpe* in the British Museum Collection and my own collection, shows a variation sufficiently marked to warrant the latter being separated as a distinct species, apart from the fact that the larva differs entirely in colour and markings from that of *minuticornis*. I therefore propose the name *hokkaida* for this new species, and give below a description of the imago and larva, and also the description of the larva of *minuticornis* taken from Moore's 'Lepidoptera of Ceylon.' In the series of eighteen specimens of *minuticornis* in the British Museum Collection, which come from Formosa, Sikhim, India, Ceylon, Java (1 ♀ type Guenée) and Australia, there still remains one male specimen from Oiwake, Japan (*ex* collection H. Pryer), which agrees remarkably well with Guenée's female type of *minuticornis* from Java (Horsfield), so that there are apparently two quite distinct, but very closely allied, species in Japan—one *minuticornis*, Guenée, whose habitat is at Oiwake, in the island of Honshū, situated at perhaps about 3000 ft. altitude, and lying between 36° to 47° northern latitude; and the other *hokkaida*, Mihi, which, so far, has been found only at Chang-yang, Central China, and on the plains of Hokkaidō, between 41° and 42° northern latitude.

Minuticornis is placed by Hampson in his unpublished manuscript of the 'Catalogue of the Lepidoptera Phalaenæ in the British Museum,' vol. xiv, in Section VI of the genus *Calpe*, to which *hokkaida* also apparently belongs :

Section VI.—Antennæ of male with uniseriate laminations :—

A. Antennæ of male with the shaft fringed with scales above towards base :—

- (a) Fore wing with distinct white streak just below costa, rather diverging from it towards apex *orthograpta*.
- (b) Fore wing without distinct white streak below costa *minuticornis*.

Description.

Calpe hokkaida, sp. n.

♂. Head, thorax, and abdomen pale brown, the latter grey-tinged. Fore wings lustrous pale brown, with numerous whitish striæ and traversed by olive brown lines; subbasal line inwardly oblique, not extended to dorsum; antemedial line inwardly oblique, medial line oblique, sharply elbowed at end of cell; postmedial line coppery red, oblique from apex to dorsum a third from tornus; all the lines inwardly edged with olive brown, and there are some olive brown clouds between the postmedial line and the olive brown undulated subterminal line. Fringes brown, paler at base, terminal line

brown. Hind wings pale brown with darker medial line and outer border; terminal line brown, fringes whitish. Underside whitish brown with a broad purplish transverse shade beyond middle of fore wings and two undulated lines beyond the blackish discoidal mark on hind wings.

♀. Similar to the male but darker in colour, especially on the hind wings.

Expanse: ♂ 48 mm.; ♀ 53 mm.

Collection number 1163. Reference to British Museum, Noctuinae, Drawer 207.

Local distribution.—Hokkaidō.

General distribution.—British Museum Collection, Central China, Chang-yang (Pratt), 1 ♂. Japan, Hokkaidō (Andrews), 2 ♀. Wileman Collection, Hokkaidō, Hakodate, 1 ♂ type bred from larva of August 7th, 1902, 1 ♂ bred August 6th, 1902, 1 ♂ bred, undated, 1 ♀ type (Andrews), undated, unlocalised.

Larva (described from artist's figure).—Length about 58 mm. Head pale yellow. (One side of head only described.) Four black spots. One large one on the side, and one small one just above; two on the central area, namely one in the centre and one above on vertex of head. The two side spots are no doubt reduplicated on the other side of the head. Colour black. The body intersected dorsally and laterally with a few slender, thread-like, silver, longitudinal lines, more conspicuous on the anterior segments. Legs, prolegs and claspers pale yellow.

Food-plant.—This has been identified for me from the figure painted by my Japanese artist in Hakodate as being *probably Corydalis pallida*, Persoon, var. *platycarpa*, Maxim, Japanese name *Kikeman*.

Figured July 8th, 1902, pupated July 15th, 1902, ♂ imago emerged August 7th, 1902.

Larva and pupa of Calpe minuticornis, Guenée.—“Larva olive-grey; with a subdorsal row of black-bordered yellow spots and clots, and a sublateral row of small yellow spots; a sublateral pale pinkish-bordered black line enclosing the spots from fifth segment; stigmata black; head ochreous yellow with a black cheek-spot; legs pale pink. Pupa dark purplish-red. Feeds on *Cocculus macrocarpus*, etc. (Thwaites).” Moore (*l. c.*).

Lane End,
Westcott,
Dorking.

NOTES ON BRITISH ORTHOPTERA IN 1921.

By W. J. LUCAS, B.A., F.E.S.

Forficulodea.—Earwigs (*Forficula auricularia*, Linn.), that are found as imagines in the early months of the year, we are accustomed to look upon as having hibernated in that stage; but we are still somewhat uncertain when, in a state of nature, the earliest imagines of the new season begin to appear. In 1921 R. South found a female between 8 and 17 June at Padworth in Berks; but I first noticed one myself, a male, at Merton Park, Surrey, on 26 June. C. W. Bracken found the variety *forcipata*, Steph., common at Newquay in Cornwall in August; and I took one on the road between Esher and Oxshott, Surrey, on 29 Sept. The latter was interesting as having the pale spot distinct on the visible point of the wings.

Blattodea.—On 31 May in the New Forest I found in the damp layer at the bottom of a heap of cut heath or heather a fairly large nymph of *Ectobius lapponicus*, Linn.; this apparently had hibernated as a nymph. Again in the Forest on 12 September, under a collection of dead leaves and sticks by the side of Blackwater, I met with two or three small nymphs, which clearly were going to hibernate in that stage. Of *Ectobius perspicillaris*,* Herbst., an interesting record has come to hand. H. M. Hallett, while at Llangennith at the extreme end of Gower Peninsula in Glamorganshire during the second fortnight of July, found this cockroach in all stages of growth. One was carrying its ootheca; but this fell out while the insect was being mounted. The nymphs, which ranged from straw-colour to a reddish tinge, were most agile. They occurred in all their stages under *Erodium*, but were found most plentifully under cut Marram-grass. In that district they mow the grass for the purpose of thatching hay-ricks, and it was under recently mown material that the insects abounded. The imagines made no effort to fly when disturbed, but their rapidity of movement was quite sufficient to render catching them a work of more than ordinary difficulty. Mr. Hallett was kind enough to present me with two females and an ootheca. K. G. Blair found a male *Blatta orientalis*, Linn., in the Isle of Man from 1–12 July in a garden, but near a kitchen. In the refuse tip at Penarth, Glamorganshire, H. M. Hallett states that he frequently turns up *B. orientalis* in all stages under old sacks, sheets of old linoleum, etc.

* As suggested in my 'British Orthoptera,' p. 72, footnote, *E. perspicillaris* is almost certainly only a pale form of *E. lapponicus*.

Gryllodea.—*Nemobius sylvestris*, Fabr., did not make itself noticeable in the New Forest, but it was not necessarily less common than usual. Between 31 Aug. and 20 Sept. a few small nymphs were met with on one occasion; possibly the drought had caused the imagines to be over early, as I did not see any. E. A. C. Stowell on a visit to Selborne enquired for the "Short Lithe," where Gilbert White used to get the Field Cricket, *Gryllus campestris*, Linn.; but, if his identification was correct, found it now planted with beech. One interesting accompaniment of the long drought was a great recrudescence of the activities of the House Cricket, *Gryllus domesticus*, Linn. For some years I had not seen or heard this insect in the Kingston district, but during the summer and autumn it was remarkably evident in Kingston, Surbiton and New Malden at least. At night one was greeted with its chirpings out of doors in all directions, and this continued well into October, the sound becoming fainter at last, as if the insects were retiring indoors. Since they could not have arisen spontaneously, the race apparently must have been continuing somewhat obscurely, till the hot and dry weather caused a great increase in their numbers, and brought them out of doors and so into prominent notice. K. G. Blair makes a similar report for Hendon in June. H. M. Hallett tells me (*in litt.* 19 Aug., 1921) that the House Cricket swarms in the town refuse-tip at Penarth in Glamorganshire, but seems very much scarcer in houses than it used to be, though he had heard it recently both in Penarth and Cardiff, as well as in colliery villages in the county. On 5 December I heard one in the evening at the Royal Caledonian School, Bushey, Herts, and was told that the Crickets were common there and were found to be a nuisance. When attention was called to the chirp, one person present discovered that he could not hear it, the pitch presumably being too high. At the beginning of May the next year (1922) I received a female from the School, where they were then not numerous. It had a double postal journey before reaching me, but arrived apparently quite well. No doubt other observers could report an increase last summer in the number and activity of the House Cricket. K. G. Blair had brought to him a female of *Gryllus bimaculatus*, De Geer, from the London Docks in August. This of course is only a casual arrival.

Locustodea.—*Pholidoptera griseoaptera*, De Geer, was taken at Send in Surrey on 28 July (G. Fox-Wilson). One captured on 13 September in the New Forest, when eviscerated, contained only yellowish eggs, apparently not ready for laying (Lucas). H. M. Hallett reports that *Phasgonura viridissima*, Linn., is not uncommon in parts of Glamorganshire. He has several times come across it himself, and others have sent or shown it to him. Two males of *Leptophyes punctatissima*, Bosc, were taken at

Abersock in Carnarvonshire in September (T. V. Campbell). Besides the above new records, the outstanding event in connection with the Locustodea is the capture of a macropterous female of *Metrioptera brachyptera*, Linn. This was taken by G. Fox-Wilson at 9.30 a.m. on 3 August resting on a vine rod about 2½ feet above the ground in the Early Vinery at the Royal Horticultural Society's Gardens at Wisley in Surrey. The side and top ventilators were half open, which means that a wide enough space was left to admit a bird as large as a plover. The insect was resting on the rod quite near the side ventilator at the north end of the house on the east side. The Vinery is composed of three houses—Early, Medium and Late—joined into one house, and is about the middle house of a group of 8 glass-houses. On the north end of the house a shrub-border runs, with herbaceous borders, etc., beyond it. On the south there is a lawn used for hay, with the vegetable garden behind it. Wisley Common is 200 yards away on the east side. Consequently it is quite reasonable to suppose that the insect was bred on the Common and flew in at the ventilator. It is at present a unique British example of this form of *M. brachyptera*, but not absolutely the only specimen known. The figure is multiplied by $1\frac{1}{2}$, and, though the hind-wing is somewhat folded, the venation appears to be as marked.



[W. J. L., photo.]

Metrioptera brachyptera, Linn. ($\times 1\frac{1}{2}$).
(Macropterous female.)

The hind wing is somewhat folded, but venation appears to be as indicated.

Sc = subcosta. R = radius. M = medius.

Cu = cubitus. IA = first anal.

Acridiodea.—G. T. Lyle captured at Wicken Fen, quite at the beginning of April, a very dark male imago of *Tetrix subulatus*, Linn., which he sent to me. Later he was able to send a female (captured there on 1 May) with somewhat pale pronotum, edged, with paler yellowish-brown. On 6 June at one of the haunts of this insect in the New Forest I took only one male and two females, although it was a bright day. No doubt most of the hibernated examples had died after the next generation had been provided for. On 30 May I captured in the New Forest a large dark speckled female imago of its congener *Tetrix bipunctatus*, Linn. On 13 June in the New Forest the first imago of *Gompho-*

cerus maculatus, Linn., was secured—a female with pale mid-dorsal line to head and thorax, and pale dorsal part of closed wings. In August Bracken took this species at Newquay in Cornwall. *Mecostethus grossus*, Linn., was found mature in the New Forest on 21 July. Others were taken there in various localities afterwards. A nymph captured on 31 July produced a female imago on 6 August. Of *Omocestus rufipes*, Zett., the last noted was a male on 12 September in the New Forest, but no particular search was made for the species. *Omocestus viridulus*, Linn., was taken mature as early as 30 May, in the New Forest. On 1 July imagines were met with at Elstree Reservoir and at Stanmore Common in Middlesex. A fine female was taken at Hillend Hill, Pentlands, Midlothian, on 23 July (Evans). On 2 July the common grasshopper, *Stauroderus bicolor*, Charp., was found mature on high dry ground near Chessington in Surrey: there were numbers of nymphs, but few imagines. Later, on 27 August, at the same place, though there were darker specimens, most examples were light in colour, often with pale yellowish longitudinal stripes, thus assimilating very markedly with the scorched grass: occasionally they had a reddish or greenish tint in parts. Dr. B. P. Campbell sent me 19 males and 20 females which he took on 17 July at St. Cyrus near Montrose. The females varied as usual in colour, the males were much more uniform in tint. A male was captured at Abersock in Carnarvonshire on 1 Sept. (T. V. Campbell). One was taken on Esher Common in Surrey on 29 September, when, after the fires and drought, grasshoppers were few in number. On 3 July a male *Chorthippus parallelus*, Zett., was found mature near Chessington. The species was taken there again, green in colour, on 27 August.

On the whole the season for grasshoppers appeared to be an early one; but apparently it ended early also. From 31 Aug.—20 Sept. in the New Forest they were not particularly numerous, nor were their songs very often heard.

I must not conclude without referring to an addition to the known Orthopterous fauna of the Channel Islands. On 23 Oct. 1921 J. R. le B. Tomlin gave me a female earwig, *Forficula pubescens*, Gén  , which he took in Guernsey in September. The females of some species of *Forficula* are rather alike, but, after detailed examination by K. G. Blair and myself, there was no doubt about its identity. Entomological visitors to Guernsey will perhaps secure other specimens, including males, of this earwig, which has not yet been found in Britain.

Kingston-on-Thames;
July, 1922.

A NEW MYMARID FROM NORTH WALES.

BY LIEUT.-COL. ALFRED W. RYLAND, F.R.M.S.

Neurotes flaviventris, sp. nov.

♂. *Head*, viewed from above, subdeplanate, almost twice as broad as long and slightly broader than thorax; in side view globose with a line of five or six stout hairs running from the vertex to frons; antennæ filiform, of ♂ thirteen-jointed and longer than insect; scape dilate, sinuate, elongate and twice as long as first flagellum joint; pedicellus broad and compressed, sub-equal in length to first flagellum joint; first joint of flagellum half the length of the scape, the four following joints equal in length and slightly longer than the first; the sixth to tenth equal in length and each slightly longer than the fifth; the apical joint slightly longer than the tenth joint. *Thorax* long, one fifth longer than abdomen; in side view elongate deplicate and apically truncate. *Abdomen* subsessile. *Legs* slender and elongate, and seated compact at base of thorax; all tarsi longer than their respective tibiæ or femora: all femora shorter than their respective tibiæ; tarsi five-jointed. *Wings* narrow and elongate with the costal margin convex and the lower margin straight; pilosity infumate; cilia long, the longest nearly double the width of the broadest part of the wing. Costal nervure strongly elongate, slightly more than half length of wing, and slightly enlarged at tip. Hind wings narrow, and more than two thirds as long as front wings, with long cilia.

Head and *thorax* infusate-fuliginous; scape, pedicel, entire *legs* and ventral side of *abdomen* flavous; flagellum somewhat darker than scape; dorsal area of *abdomen* nigrescent. *Abdomen* subsessile and, in side view, subcuneiform, as deep as long and attached to thorax at lower point of base. Tarsi of first legs longest, of hind legs shortest. Tibiæ of centre and hind legs of equal length; femora of front and centre legs of equal length. First and fifth joints of tarsi of front legs of equal length and nearly double that of their respective intermediate joints: all second, third and fourth tarsi joints of equal length except the third joints of the centre legs, which are slightly shorter.

Length, ♂ ♂, .65 mm., .74 mm.

At first sight this insect is much like *Polynema*, Hal., but the abdomen is subsessile, the thorax longer, and the legs all seated far back; and it differs from *Neurotes** *iridescens*, Enoch, in the entire pilosity of the front wings, which are more narrow and elongate, with the apices more elongately ciliate.

♀. (Somewhat damaged.) Scape slightly shorter than that of ♂. Antennæ broken off above second flagellum joint; first joint one-third length of scape, second joint more than twice as long as first. Thorax somewhat stouter and not quite so apically truncate as in ♂.

* This genus was described by Enoch in the 'Hastings and E. Sussex Nat.', vol. ii, 1915, p. 178. The present insect is best placed therein for the present, though the elongate alar cilia allies it more closely with *Litus*, Hal.—C.M.

Ventral side of abdomen extending below point of attachment with thorax, and ascending from base in a straight line to anus. Terebra not extending beyond anus. Legs not quite so long as in ♂; tarsi of the centre and hind legs the same length as their respective femora, and not longer; all second, third and fourth joints of equal length except the third joints of the centre and hind legs, which are slightly shorter. Wings shorter than those of ♂ and proportionally narrower.

Length, ♀ .62 mm.

Captured on long fine grass at the top of hill Bryn Euryn, Rhos, near Colwyn Bay, North Wales, ♂ on September 29th, and ♂ ♀ on October 1st, 1921, respectively.

Glen Hurst,
Fulwood,
Preston;
May 4th, 1922.

NEW CHALCID FLIES FROM AUSTRALIA.

By A. A. GIRAULT.

Types in Queensland Museum and from Queensland unless otherwise stated. Descriptions based upon comparisons, hence their brevity.

1. *Babinda dei*, **sp. nov.**—As genotype, but tibia 3 jet save apex and knee narrowly, antennæ jet save basal $\frac{1}{3}$ scape, also ventral margin femur 2 black. Postmarginal vein somewhat longer. Types compared.

1 ♀, forest, Wynnum, March 30th, 1922.

2. *Erythmelus tintoreti*, **sp. nov.**—As *cinctus*, but tibia 1 for the most part dusky, distal funicle no larger than others and a half wider than long; discal cilia of fore wing of two long lines from venation to apex, one cephalad, one mid-longitudinal; and fringes twice greatest wing width.

Very distinct species. Wynnum, on a shop window, April 2nd, 1922.

RAFFÆLLIA, **gen. nov.** Encyrtini.

As *Pseudaphycus*, but metallic, and 1 of jaw distinctly shorter than the acute 2 or 3, the jaw narrow. Habitus of *Coccidentocyrus*. Scape moderately dilated.

3. *R. sidneyi*, **sp. nov.**—Dark æneus, wings clear, veins brown. Knees, tibial tips, tarsi white, funicle soiled white. Pedicel twice funicle 1, latter cup-shaped, a bit longer than wide, 2-3 equal, somewhat wider than long, 4-5 quadrate, twice 3 and distinctly larger than 1. Only 2-3 lines of cilia proximad hairless line and these incomplete, caudad abruptly finer and fainter. A line of minute

cilia along submarginal to base. Postmarginal a short stout cone. Frons moderate, scrobes deep. Stigmal vein straight, paler, its knob not differentiated. Club top-heavy, blunt at apex.

Sydney, New South Wales, forest, October 28th, 1917.

MESOCALOCERINUS, gen. nov. Ectromini.

As *Xenostrycis*, but ovipositor not extruded, and as *Cristatithorax*, but scutellum simple, form and antennæ slender. Frons moderately wide.

4. *M. gemmus*, **sp. nov.**—Purple, head, thorax cephalad of scutellum save cephalic margin of scutum on each side of meson and cephalic margin of axilla and neck of prothorax, honey; basal $\frac{1}{4}$ abdomen, legs save coxæ and the hind femora and tibiæ save ends of latter, scape, whitish. Fore wings smoky from base of marginal $\frac{5}{6}$ way to apex, the dense cilia coterminous with infuscation. Scape, flagellum cylindrical, funicles subequal, $\frac{3}{4}$ longer than wide, a bit shorter than pedicel. Postmarginal very short, stigmal short, nearly half of marginal. Basal $\frac{1}{2}$ femora and tibiæ 3 white.

Wynnum, forest, May 24th, 1921.

5. *Eurytomocharis omnirubricornis*, **sp. nov.**—Robust, abdomen sublanceolate, nonstylate. Black, umbilicately punctate, head and thorax with short golden pubescence. Legs save coxæ, apex ovipositor valves and antennæ save pedicel above rich red, venation and fore wing from base to apex of veins, yellow. Marginal somewhat exceeding postmarginal. Funicles longer than wide, 1–2 longest, equal, twice longer than wide, pedicel small. Propodeum with a gouged-out rather wide median channel with 2 foveæ at base, otherwise smooth and shining. Mesopleurum with oblique irregular rugæ. Prepectus scaly, with 3 foveæ in a longitudinal line, 3 largest, at cephalic edge. Abdomen 5 a bit higher than long, 2–4 moderately short, petiole very short. Ocelli in a curved line, lateral a bit further from eye than from cephalic.

Two females, Nelson and Kuranda (type), A. P. Dodd.

AUSTROENCYRTOIDEA, gen. nov. Encyrtini.

As *Zaomencyrtus* but postmarginal long, $\frac{1}{3}$ longer than stigmal, club not enlarged, frons wide, ovipositor inserted at base.

6. *A. leichhardti*, **sp. nov.**—Æneus brown, wings with a small cloud against marginal and stigmal veins, latter dark brown; tarsi, knees widely, tibiæ 1, distal $\frac{1}{3}$ or more of other tibiæ, yellow, also apex ovipositor and the scape. Latter a bit exceeding club; pedicel much exceeding any funicle; funicles 1–2 equal, a bit longer than wide, 3–4 quadrate, 5–6 largest, subquadrate, each joint with a whorl of not long bristly setæ. Cheeks, vertex with short, very sparse setæ, jaws bare. About 5 lines of cilia proximad of the hairless line, these most crowded proximo-caudad and prolonged toward base in a widely-spaced single line; a closer line along submarginal to base.

Costal cell entirely ciliated. Club $\frac{3}{4}$ funicle. Scutum with white, loose lying-down pubescence.

A female south-east Queensland.

7. *Trichogramma mirum*, **sp. nov.**—*Trichogramma australicum* in Girault, 'Memoirs Queensland Museum,' vol. iii, 1915, p. 153.

Specific character the minute bladder-like appendages on antennæ. From eggs of *Chilo*, Java. Form ought to be named until its characteristic is known to be trifling, foreign or accidental.

AUSTRALOMPHALE, **gen. nov.** Omphalini.

As *Closteromphale*, but stigmal nearly perpendicular to marginal, a bit shorter than postmarginal, a short slender neck, a moderately large knob studded with short setæ; abdomen distinctly compressed, ovipositor extruded $\frac{1}{3}$ abdomen's length, above it a compressed stylus over $\frac{2}{3}$ its length. Prothorax conical. Scape coarsely serrate on one edge. Jaw 3 truncate. Setæ from venation gross.

8. *A. auriceps*, **sp. nov.**—*Genotype*. Blue, wings clear, a deep cross-stripe from stigmal knob; head, legs save coxæ, the femur 3, the tibia 3 at basal $\frac{1}{2}$, golden. A wide coppery median stripe on dorsal thorax (save propodeum). Funicle $1\frac{1}{2}$ longer than wide or than pedicel, 4 quadrate. Club with no terminal armature.

Nelson, A. P. Dodd, August.

9. *Australomphale varicornis*, **sp. nov.**—Same, but dorsal thorax of one colour, head concolorous, wings clear, scape save slightly at apex, nearly proximal $\frac{1}{2}$ of funicles 2-4 white (club not seen). Coxæ, femur 3, femur 1 or 2 beneath and above more or less, tibiæ 1 or 2 at apex, above and below on each side of middle and near base above, dusky; tibia 3 save apex, white. Stigmal knob and base of marginal jet, with a cluster of short jet hairs (that base marginal absent in genotype). Funicle 1 nearly 3 times longer than wide.

Nelson, November, 1920, A. P. Dodd.

AUSTRALÖODERA, **gen. nov.** Eupelmini.

As *Eupelmus*, but scutellum with a tuft of bristles near apex, a smaller, looser one at base of the thickening of submarginal. Ovipositor equal abdomen.

10. *A. varicornis*, **sp. nov.**—Orange, purple as follows: Scape above at distal $\frac{1}{2}$ and a spot at basal $\frac{1}{4}$, beneath to middle from basal $\frac{1}{4}$; pedicel, funicles 1-2, 7-8, 3 above widely; cheeks centrally; abdomen except beneath at base rather widely, scutum at distal $\frac{1}{3}$ between the ridges, base coxa 3, propodeum, 2 cincti on tibia, 2 on basal $\frac{1}{2}$; ovipositor valves save basal $\frac{1}{2}$ of distal $\frac{1}{3}$. Silvery as follows: Scape, funicles 3-4 save as noted, funicles 5-6, space between cincti of tibia 2, coxa 3. Fore wings embrowned from the tuft to apex, 4 eye-spots, 1-2 opposed to each other and at margins. Post-marginal $\frac{1}{3}$ longer than the short stigmal. Scape clavate; pedicel elongate, equal funicle 3 which is longest, 3 larger than wide, 1

quadrate. Discal cilia except caudad in a few longer lines terminating at the tuft.

Four females, Kuranda and Nelson (*type*), A. P. Dodd.

11. *Aphelinus damoni*, **sp. nov.**—Orange, legs paler, wings clear, veins yellow; scutum, scutellum each with a rather wide dusky stripe on each side of median line save narrowly at each end; abdomen with 4 complete dusky stripes, a shorter one at apex; a dusky dot on axilla. Median groove scutum, scutellum distinct. Hairless line widely closed cephalad, also by one line at caudal margin, $6\frac{1}{2}$ lines of somewhat coarser cilia proximad of it, thence naked save 3 short lines from band of submarginal. Marginal distinctly shorter than submarginal, a short postmarginal ending in a bristle like those of marginal. Scutum about 20 longish setae, scutellum 6. Stigmal oblique. Hind wings 15 lines of discal cilia, the first two paired more or less save distad. Submarginal 5, marginal 4 gross bristles. Hairless line if continued would meet costa distad of venation.

An odd species. Wynnum, forest, and a second female later on March 1st, 1922. In my table follows *ruskini*.

12. *Habrolepidea raffaellini*, **sp. nov.** Legs entirely concolorous save knees, tibial tips, tarsi. Funicles twice larger than wide, equal each other and pedicel. Jaws rather narrow, somewhat as *Schedius*, 1-2 equal, subacute, 3 a half shorter. Postmarginal and stigmal equal, marginal a bit shorter, nearly twice longer than wide. Frons moderate.

Æneus, wings clear, a small cloud at marginal; club $\frac{1}{2}$ funicle. Costal cell wholly ciliated, submarginal setae gross; 4-5 lines of cilia proximad hairless line, these uniting before hind margin and running to base (at least half way there).

Somewhat like *Echthrobacca angeliconini*. 3 ♀s, forest, Sydney, New South Wales, October 28th, 1917.

MESANUSIA, **gen. nov.** Ectromini.

As *Baouusia* but club pointed-ovate, 3 deeply sunken, the region equal funicle; marginal $2\frac{1}{2}$ times longer than wide, a bit exceeding stigmal. Ovipositor concealed. Frons narrow, dilation of scape moderately great.

13. *M. latiscapus*, **sp. nov.**—Brown æneus, fore wing lightly dusky from about hairless line to apex; proximad of former cilia extending to base, the line closed near hind margin by two lines of cilia. Submarginal setae moderate, costal cell absent or nearly. Funicle 1 longest, half wider than long, 2 twice wider than long, rest gradually widening but not lengthening, all shorter than the moderate pedicel. Scape widest distad, somewhat over twice longer than wide. Hind wings translucent, with short caudal fringes, apparently naked otherwise, its submarginal long, convex.

Pentland, forest, November, 1917.

Wynnum, Queensland,
Australia.

NOTES AND OBSERVATIONS.

CORRECTION OF NOMENCLATURE OF MICROLEPIDOPTERA. — **Phalonia grisescens**, nn. (= § *griseana*, Hw.). This brief note is published for the immediate correction of the name of a species now under special study. The much-discussed *Conchylis* "*griseana*, Hw." must still be criticised from another point of view. *Tortrix griseana*, Hw., 'Lp. Br.' 402 sp., 25 (1811), is absolutely homonymous with *Tortrix griseana*, Hb., 'Smig. Eur. Schm.' 7. Pf. 21. 135 (1797). Haworth's species is therefore nameless, and **grisescens**, nn., is suggested to replace it.—JNO. HARTLEY DURRANT and J. DE JOANNIS; British Museum (N.H.), August 19th, 1922.

VANESSA C-ALBUM IN NEW FOREST.—At Brockenhurst, on Tuesday, August 15th, I took a specimen of *c-album* off a lime tree nearly opposite the New Forest Lawn Tennis Club. I believe that this species is extremely uncommon in the forest. *Colias croceus* was plentiful, though I did not come across var. *helice*.—L. H. BOND; The Cottage, Welby Gardens, Grantham.

COLOUR-PRESERVATION IN DRAGONFLIES. — L. E. CAMPBELL-TAYLOR writes: "I suppose you do not know if there is a method by which the colours of the Odonata can *satisfactorily* be preserved. I have tried for many years in a great number of ways and cannot yet find a satisfactory method. Lucas states in his book that Nunney says the colours of *Aeschna cyanea* treated with an injection of boroglyceride were *as bright after two years* as when the insect was alive. I feel bound to question the accuracy of this—at any rate boroglyceride will not do this for me; in fact it does not preserve the colours *two months*, let alone two years."

[Nunney's method of preserving the colours of Odonata was quoted for what it was worth. I have not tried it myself, nor have I heard of anyone else doing so, previous to Campbell-Taylor's attempt. Personally I should not care to put insects so treated into the cabinet. If dragonflies are placed in spirit *before any decomposition has taken place* their colours will usually be preserved almost or quite unchanged, and will be available for examination. Many species of course do not lose their colours in drying, especially after evisceration, and *occasional* specimens of other species retain them perfectly. If the conditions under which these latter keep their colours were known we should be on the way to our desired result. Unfortunately we cannot tell beforehand which specimens are going to retain their colouring, or we might discover the determining cause. Keeping dragonflies alive for a time without food seems to be an undoubted aid to colour-preservation. *Aeschna cyanea* is one species that frequently retains its colours unchanged, hence perhaps Nunney's success with that species in connection with the boroglyceride method. If, after specimens had been dried in spirit, we could relax the legs and wings without interfering with the abdomen, we might perhaps achieve some measure of success from the cabinet point of view at any rate; but for scientific purposes a naturalist would prefer to have his specimens

"doctored" as little as possible.—W. J. LUCAS; Kingston-on-Thames.]

C. CROCEUS IN SOMERSET IN MAY, JULY AND AUGUST.—*C. croceus* first appeared at Bruton this year on May 25th, when I took a ♀ of 68 mm. expanse (the largest specimen I have yet taken, although I have examined several thousand in Egypt, etc.). On May 26th I saw ab. *helice* and *C. croceus* was fairly common for a fortnight, but I have only records of females. I also took it during this same period on the Turf Moor at Ashcott and in Dorset at Shillingstone (both females). On July 27th fresh males began to emerge at Bruton, and are now not uncommon. I took my first ♀ on Aug. 7th—an ab. *helice* (also ab. *obsoleta*, Tutt).—K. J. HAYWARD, F.E.S.; Bruton, Somerset, August 8th, 1922.

COLIAS CROCEUS (EDUSA) IN AUGUST AT BRIGHTON.—I captured a fine female specimen of *Colias croceus* on the Downs here on August 15th last.—J. R. SLEATH; 112, Ditchling Road, Brighton.

COLIAS CROCEUS IN SURREY AND NORTH CORNWALL.—Whilst staying in North Cornwall in May I noted about half-a-dozen specimens of *C. croceus* in the neighbourhood of Padstow, and on the railway bank between Padstow and Okehampton. To-day when taking a few *Augiades comma* on the downs at Coulsdon, I saw, but did not capture, a male *C. croceus*, which appeared to be in fresh condition. This was during one short burst of sunshine on an otherwise almost sunless but bright morning.—ARTHUR BLISS; The Cottage, Red Down Road, Coulsdon, Surrey, August 13th, 1922.

COLIAS CROCEUS, ETC., IN SUSSEX.—On July 25th I saw a *Colias croceus* (*edusa*) on Sussex Downs, near here, and on August 10th I saw a specimen of the same species about twenty yards from the same spot. This one I was able to bag, and found it to be quite fresh and in perfect condition. I have seen no specimen since, but expect by the time this is published *C. croceus* will be plentiful in many places. On May 29th this year I netted a specimen of *Eulype hastata* whilst beating herbage in this locality. It is very like specimens taken at Rannoch, except that the black dots between the bands on fore and hind wings and the dark triangle at base of the latter are absent. On May 23rd I netted a fine specimen of *Lobophora viretata* near its food-plant. This specimen was mostly green in colour. On August 11th I took a second brood one at rest on a fir tree; it was quite fresh but without a trace of green on it; it was yellow with black markings.—(Major) J. J. JACOBS; Holmesleigh, Burgess Hill, Sussex, August 15th, 1922.

THECLA W-ALBUM IN STAFFS, ETC.—On July 31st, at Denstone, Staffs, I had a rather worn ♀ of *T. w-album* brought to me which had been found with another specimen near Denstone. The other specimen was not taken, however. This seems curious, since the last North Staffs F.C. record is one seen in 1902 at Market Drayton by Messrs. E. D. Bostock and F. C. Woodforde. It apparently also used to occur near Burton. On August 10th, near Godalming, I saw a specimen of *C. croceus*.—GUY STANTON; The Glebe Farm, Shackleford, Godalming, August 13th, 1922.

COLIAS CROCEUS, FOURC. (EDUSA, FAB.).—As several inquiries have been received with regard to the use of the name *croceus* for the species usually and very generally known as *edusa*, it may be stated that it is purely a question of priority. Fourcroy gave the name *croceus* to the species in the year 1785; Fabricius did not publish his *edusa* till 1787. That *croceus* is the right name was pointed out by Kirby in 1871, but very few writers have adopted it. It is used here because it is the right name, in the hope that it may be generally adopted, to the benefit of future entomologists.—N. D. R.

A RECORD CAPTURE OF BLUES.—Mr. C. G. Clutterbuck and myself saw in an area of about 200 yards, in the Bainswick district, Glos., the following Blues: *Aricia medon* (*astrarche*), *Polyommatus icarus*, *Agriades bellargus*, *Cupido minimus* and *Lycæna arion*—surely a record. The date was June 10th, 1922.—G. H. SIMPSON HAYWARD; Icomb Place, Stow-on-the-Wold.

PHRYXUS LIVORNICA LARVA IN SOMERSET.—A larva of *Phryxus livornica* was brought to me a few weeks ago, found by a small boy in a field near, on dock. The imago has emerged to-day.—A. R. HAYWARD; Misterton, Somerset, August 3rd, 1922.

PACHYS BETULARIA DOUBLEDAYARIA AT SOUTH NORWOOD.—A male specimen of *doubledayaria* was found at rest on the pavement in Grange Road, S. Norwood, in the forenoon of July 23rd last. It seemed to be in good condition when I picked it up. As I had no box to put it in it allowed itself to be carried for about a mile clinging to a finger of my hand.—RICHARD SOUTH; 4, Mapesbury Court.

NOTES ON LEPIDOPTERA FROM THE NEW FOREST AND SWANAGE, 1922.—A week in the New Forest this year, from July 1st to the 8th, proved rather disappointing, mainly owing to the inclement weather. Many species of butterfly appear to have been late this summer. *Limenitis sibylla* was plentiful and in much better condition than is generally the case by July. *Argynnis paphia*, males, just emerged, were about in good numbers, but only one female was seen during the week. *Argynnis aglaia* and *A. cydippe* were fully out and fairly common near Brockenhurst. *Brenthis selene* showed evidence of late emergence, as it was still in quite good order. Nothing was seen of *Satyrus semele*, *Aphantopus hyperanthus*, *Epinephele tithonus* and *Adopaea thaumais*. Males of *Diacrisia sanio* frequently turned up on the heather, and *Euchloris pustulata* was not uncommon at dusk. Sugar proved attractive on several nights at Hurst Hill, but only common species visited it. *Boarmia roboraria*, *B. repandata*, *Noctua brunnea*, *Xylophasia monoglyphat*, *Aplecta nebulosa*, *Eupleria lucipara* and *Triphaena pronuba* were most in evidence, the latter a perfect pest. The following week was spent at Swanage, and the weather improved somewhat. *Melanargia galatea* and *A. aglaia* were both abundant. *Lycæna ægon* swarmed on the moors north of Studland and also occurred in lesser numbers on the downs, far removed from heather. *Zizera minima* and

Lycaena bellargus, first brood, were still about in considerable numbers, but only one or two *Satyrus semele* were seen. *Adopaea actaeon* was late, not appearing until July 11th, and not more than a dozen were seen up to the 15th, when I left. *Macroglossa stellatarum* was not uncommon in the vicinity of the town. Sugar was attractive on the undercliffs, but produced no typical coast species.—S. B. HODGSON; 3, Bassett Road, N. Kensington.

LEPIDOPTERA IN THE BRADFIELD (READING) DISTRICT, 1922.—A list of the species of butterflies met with near Bradfield College in the marshes and woods during the week ending August 1st may be of interest. The weather was showery with very hot intervals, generally of about an hour's duration. Yet in the marshes west of the College buildings *Pieris rapae* and *P. napi* were in great abundance, also *Polyommatus icarus*, *Heodes phlaeas*, *Aphantopus (hyperanthus)* and *Epinephile jurtina*. *Vanessa io* and *Aglais urticae* were plentiful, and I saw one specimen of *Limenitis sibylla*, in very bad condition. At the Reservoir, a large open space in the woods planted with shrubs and saplings, *Zephyrus quercus* and *Callophrys rubi* were to be seen flying quickly over the trees. *L. sibylla* and *Dryas paphia* were plentiful, though extremely fast on the wing. *P. rapae* and *P. napi* abounded. I saw one specimen only of *Adopaea flava*, which used to be plentiful; whilst, of the other Skippers which used to abound here before the ground was ploughed for planting saplings, I detected none. I saw and caught one specimen each of *Melanargia galatea*, *Aricia medon* and *Satyrus semele*. The latter, however, escaped. *A. hyperanthus* and *Epinephile tithonus* were swarming over wild rose-bushes. *Coenonympha pamphilus* was everywhere. *Thecla w-album* could be seen flying high over a certain hedge not far distant. During the past term one larva of *Polygonia c-album* was found on nettle and pupated in due course, imago hatching about July 29th; many larvæ of *Dicranura vinula* were collected, and one specimen of *Amorpha populi*.—C. J. V. GRAY; 17, St. John's Park, Blackheath, S.E. 3.

DANAIS CHRYSIPPUS, L., AB. CANDIDATA, HAYWARD.—Since my notes on *Danais chrysippus*, L. (*antea*, p. 178), were written, I have succeeded in breeding (under natural conditions) a further specimen of ab. *candidata*—a male specimen identical with the type. I also saw but failed to take a similar insect (sex not determined) on the wing. Both at Reservoir, near Aswan, Egypt.—KENNETH HAYWARD; Vicarage, Bruton, Somerset.

A VARIETY OF CUPIDO MINIMUS.—On June 7th I found *C. minimus* very common in several places along the Downs, near Lewes, and on examining those settling at sun-down on grass stems I found amongst them a male with the submarginal spots produced to form fine rays or streaks on the undersides on all four wings.—E. CRISP; Heathcote, Heathfield, Sussex.

BUTTERFLIES ATTRACTED BY HUMAN PERSPIRATION.—Mr. Mathew's note in the May number of the 'Entomologist' has reminded me of similar occurrences, although the butterflies in these cases were far less abundant, both in numbers and species. In the

Mhondo forest, a favourite collecting-ground, which lies close to the lake, at a distance of about three miles south of Bukoba, butterflies—*Lycænids* and *Acræa*—would frequently alight on my bare arms to imbibe moisture, while I was resting in the shade beside a stream which flows through to the lake. Several of these were captured, but I regret I am unable to identify them at present.—N. C. E. MILLER; Mwanza, Lake Victoria Nyanza, E. Africa, July 9th, 1922.

HYBRIDISATION IN NATURE.—*Re* the note in the August number of the 'Entomologist' on hybridisation in nature, on June 24th, while sugaring in some woods a few miles from here, I took an *X. monoglypha* (male) and *A. nebulosa* (female) *in cop.* Unfortunately both died while still paired, so that no ova were obtained.—ALFRED H. SPLOING; 65, Manners Road, Southsea, Portsmouth, August 8th, 1922.

RECENT LITERATURE.

Natureland: A Quarterly Journal of Natural History. Edited by GRAHAM RENSHAW. Manchester: Sherratt and Hughes.

NUMBER 3, Vol. I, of this comparatively new periodical contains some excellent photographic reproductions, including one of *Euvanesa antiopa*, but is devoted mainly to Vertebrates and contains little of direct entomological interest. It is, however, well got up, and touches on many matters of more general interest, as suggested by its title.

The London Naturalist (Journal of the London Natural History Society) for 1921. Pp. xx + 80, with 1 plate. London: Published by the Society.

To those interested in structural abnormalities in Lepidoptera this volume should prove of immense assistance, as the greater part of it is occupied by an exhaustive paper on that subject by Dr. E. A. Cockayne, who has most successfully attempted to collect and group all the scattered references in entomological literature to this subject, supplementing this information throughout with a number of new observations of his own.

Records and Observations of British Lepidoptera during 1921. By S. GORDON SMITH and E. NEVILL WILMER. Pp. 71, 2 plates. Chester: G. R. Griffith, Ltd., 1922.

THIS small publication, consisting of a complete list of the 356 different species obtained by the authors in one season's collecting, chiefly around Chester, N. Wales and the New Forest, is mainly of interest on account of the methods employed. By means of a self-contained motor-caravan, fitted with a powerful electric light, some interesting data as to times of flight and the suitability of atmospheric conditions were obtained. A temperature below 50° Fahrenheit proved fatal to good results, but the barometer readings afforded little clue.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 3rd, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.—The President announced the death of Mr. A. W. Bacot, of York Cottage, York Hill, Loughton, Essex, and of Mr. Gilbert Storey, of the Department of Agriculture, Cairo, Egypt, and a vote of condolence was passed to their relatives.—The following were elected Fellows of the Society: Mr. C. L. Collenette, c/o Messrs. Barker & Co., Singapore; and Mr. Michael G. L. Perkins, 4, Dean's Yard, Westminster Abbey, S.W. 1, and Trinity College, Cambridge.—The Treasurer called attention to additions to the collection of portraits in the meeting room, and especially to a beautiful pencil drawing from a photograph of the late Dr. Longstaff.—Mr. W. G. Sheldon exhibited a series of *Pararge roreana* from Herculesbad, and *P. clumene* from Sarepta.—Prof. E. B. Poulton, F.R.S., illustrated some of his remarks with lantern-slides, and read some notes on the life-history of *Catochrysops phasma*, and on the life-history of a Bethyloid of the genus *Cephalonomia*, Westw., observed at Oxford by Mr. A. H. Hamlin; he also read some interesting notes on the habits of the Driver-ant *Dorylus nigricans*, Illig., in Tanganyika Territory.—Mr. C. L. Withycombe exhibited larvæ of an adult of *Osmylus chrysops* with some enlarged figures of them, and also some larvæ of the mosquito *Taeniorhynchus richiardi* taken in Epping Forest.—The following papers were read: "The Mallophaga of the Oxford University Expedition to Spitzbergen," by Dr. J. Waterston, B.D., D.Sc.; "The Dasytinae of South Africa," by Mr. G. C. Champion, F.Z.S., A.L.S.; "A Monograph of the Genus *Catochrysops*," by Mr. G. T. Bethune-Baker, F.L.S.; and "The Species of the Genus *Larinopoda*," by Dr. H. Eltringham, M.A., D.Sc., F.Z.S.—S. A. NEAVE, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 25th.*—Mr. E. J. Bunnett, F.E.S., President, in the Chair. Mr. Step exhibited the beetles *Necrophorus vespillo* and *Silpha thoracica* from a dead toad at Ockham, and Mr. Withycombe, the asparagus beetle *Crioceris asparagi*, now common at Enfield.—Mr. R. Adkin read a paper, "The Lepidopterous Enemies of Man."

June 8th.—Mr. E. J. Bunnett, F.E.S., President, in the Chair.—Mr. Step exhibited a *Vespa germanica*, ♀, which had hibernated in a chimney and was so misleadingly black as to suggest a new species!—Mr. Eneferan *Acrionicta alni*, of which he had found three larvæ at Penzance in August, 1921.—Mr. Withycombe, a Neuropteran, the rare *Chrysopa dorsalis*, bred from a pine-feeding larva at Oxshott in 1921.—Mr. Preston, butterflies from Macedonia, and Mr. Bunnett, ova, larvæ and imagines of *Melasma populi* (Col.), from Oxshott, where it was found very commonly.—Mr. Step said that the *Cleora lichenaria* larvæ he had shown at a previous meeting had extended their feeding two or three weeks beyond the normal time and were found to be ichneumonised, except one which had developed to an imago in the normal period.—Mr. Coulson reported the capture of

Phryxus livornica at Merton, Surrey, on May 15th.—Various reports were made of the occurrence of *Colias croceus* (*edusa*) on the N. Downs, etc.

June 22nd.—Mr. E. J. Bunnett, F.E.S., President, in the Chair.—Mr. Staniland exhibited *Pterognathus gigas* and *Archon centaurus* (Col.) from the Gold Coast.—Mr. Withycombe, the Neuroptera (1) *Osmylus chrysops* alive with its larva, (2) *Sialis lutaria* and a living larva, (3) *Ithone fusca* from Australia and a preserved larva, (4) *Psychopsis leonina* from Africa and a preserved larva from Australia, and (5) *Stenosmylus excisus* from New Zealand, and gave notes on their life-histories.—Mr. Buckhurst, *Hesperia malvae* ab. *taras* from Effingham.—Mr. Goodman, aberrations of *Parnassius apollo* much approaching *P. delius*, from St. Martin Vesubie, *P. delius* with sparser markings than usual, and a *Parnassius* with characters intermediate between *delius* and *apollo* suggestive of a natural hybrid.—Mr. Syms, a larva of *Ruralis betulae* and a larva of *Anthophagus vacca* (Col.) in its cell for pupation.—H. J. TURNER, *Hon. Sec.*

OBITUARY.

H. H. C. J. DRUCE.

SON of Herbert Druce, whose writings were concerned chiefly with Heterocera, Hamilton Druce, stimulated no doubt by his father's collections, early evinced a keen interest in Lepidoptera, which developed into a specialisation on the Lycænidae and Hesperidae. His papers, of which the earliest was published in February, 1887, in the 'Ent. Mo. Mag.' (vol. xxiii, p. 203), at the age of nineteen, were numerous, but confined almost entirely to his favourite families. Included in them are: "A Monograph of the Genus *Hypochrysops*" ('Trans. Ent. Soc.,' 1891); "A Revision of the Genus *Iolaus*" ('Ann. Mag. Nat. Hist.' (6) vol. viii, 1891); "The Lycænidae of the Solomon Isles" ('Proc. Zool. Soc.,' 1891); "Lycænidae of the S. Pacific Isles" ('Proc. Zool. Soc.,' 1892); "A Monograph of the Genus *Thysonotis*" ('Proc. Zool. Soc.,' 1893, in collaboration with Bethune Baker); "A Monograph of Bornean Lycænidae" ('Proc. Zool. Soc.,' 1895), with additions in the same publication in 1896; and a long and valuable paper on "Neotropical Lycænidae" in 'Proc. Zool. Soc.,' 1907. A large number of shorter papers appeared from him, mainly in the 'Annals,' the 'Ent. Mo. Mag.,' the 'Proc. Zool. Soc.,' and the 'Trans. Ent. Soc.,' the last being in the 'Annals' for March, 1913. His only separately published work was a small but very valuable volume containing photographic reproductions of many of the type-specimens of Lycænidae in the Berlin Museum, but he was, until forced to give up on account of ill-health, actively engaged in completing the volumes on Rhopalocera in the Fauna of British India Series. His collections are now in the Hill Museum, Witley, having been purchased by Mr. J. J. Joicey some three or four years ago.

Seriously ill for some years past now, and unable to follow actively his favourite study, he recovered sufficiently latterly to be able to visit again some of his old haunts, but not for long, as he died rather suddenly, we regret to hear, on June 21st last, at the age of 54. And so yet another is added to our already too long list of losses.

N. D. R.

F. B. NEWNHAM, M.A.

YET another of our older Entomologists has been claimed by the angel of death in the person of F. B. Newnham, who passed away very suddenly on June 2nd last, and was laid to rest in the cemetery here surrounded by the woods that he had worked and loved so much.

Born 72 years ago at Kerry, Montgomeryshire, his younger days were spent in France and India. After taking his M.A. at Oxford he studied for the Bar, and when about to be called was struck with a nervous breakdown, and sent to Church Stretton over 40 years back. Its bracing climate soon had the desired effect, and he was so taken with the place and its insect fauna that he abandoned the law, giving himself up to Entomology and never leaving, except for a four months' stay in Switzerland and one delightful three weeks with me at Fontainebleau. He had travelled throughout most of the Palearctic Region, and amassed a remarkably fine collection of Lepidoptera.

After settling here he never missed a fine day in the field, and was exceedingly lucky in finding variations, in which his collection abounds. His chief prize was a very wonderful ab. of *Aglaia* with pale fawn ground and all the black markings on the upper side replaced by silver. In our numberless outings together he was always the lucky one, excepting when a gynandrous *icarus* fell to my net. We were together in discovering the occurrence of *L. corydon* here in 1916, and never previously noted in Shropshire.

Like his friend, the late Dr. Chapman, with whom he often corresponded, Newnham was a very strong upholder of the law of priority in nomenclature, and was equally averse to the needless multiplication of genera, arguing that it is more scientific to include and retain as many species as possible under one head. He was fond of quoting "*Rumicia*" *phlaeas* as a flagrant example of senseless change.

He was responsible for the Lepidoptera Section of the 'Victorian History of Shropshire,' and in 1894 separated, under the name of *hesperidis*, a dwarf race of *A. cardamines* regularly occurring here.

A devoted student of Nature, full of humour, he had a ready joke and kindly word for everyone, and was always pleased to show his treasures to the numerous entomologists visiting this district. He remained a bachelor, wedded to his hobby and the classics, reading usually until two in the morning and up again at seven for a long day in the field. Thus, his happy earthly life was passed. He has now crossed to those happier hunting-grounds that he loved to talk of, leaving those who knew him to mourn the loss of a true friend.

M. J. H.

Church Stretton;
August 21st, 1922.

2/6



Your very truly
D. Sharp.

THE ENTOMOLOGIST.

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OCTOBER, 1922.

[No. 713

DAVID SHARP, M.A., M.B., F.R.S., ETC.

1840-1922.

(Plate III.)

WITH the deepest feelings of regret we have to chronicle the passing away in the person of David Sharp of one from the very front rank of zoologists, and we would like to express our sympathy with his family and other relatives in their loss—a loss which will appeal also to many a naturalist. Sharp's reputation as a learned and highly scientific entomologist was world-wide, and he probably had few equals, if any, in his favourite Order, the Coleoptera. He wrote largely, and has left for those who follow in his steps a deep well of knowledge from which to draw. Such as knew him personally were particularly struck by the close touch and intimate association with living things that were always revealed when he spoke of his experiences in connection with insects and indeed with Nature in general. Such experiences, scarcely capable of transmission by writing, have gone to the grave with our late friend, and we cannot help feeling that there is something unsatisfactory in the nature of things, if so much of a man's life work, looked at from this point of view, seems almost to have been done in vain.

David Sharp was born at Towcester on 18th October, 1840. Some twelve years later his parents removed to London, where therefore, as a boy he received his education. After attending one or two preparatory schools, in 1853 he entered St. John's Foundation School which was then at Kilburn. At the age of seventeen he commenced to help his father, a leather merchant, and about the same time he began collecting beetles, some of his favourite haunts being Ken Wood and Hammersmith Marshes, as well as the sandy shores about Deal and Dover. As it was found that he had a great distaste for a business life, it was decided that he should qualify as a doctor. He accordingly, after studying for two years at St. Bartholomew's Hospital, went to the University of Edinburgh, where he obtained the degree of Bachelor of Medicine in 1866. After graduation he assisted a friend with his practice in London for a year or two. He had at first some thought of seeking an appointment in connection with entomology at the British Museum, but abandoned the idea; and about ten years later he went so far as to apply for the post of Curator of the City of Glasgow Industrial Museum, being recommended by H. W. Bates and Frederick Smith amongst

others. However, after his short residence in London he was offered a post as medical officer in the Crichton Asylum at Dumfries, which led to his taking charge of a case at Thornhill in the neighbourhood, where he joined the Dumfriesshire and Galloway Scientific, Natural History, and Antiquarian Society upon its reconstruction in 1876. This engagement gave him the leisure he desired for prosecuting the studies on which his heart was set, and it was during this period that he published some of his earlier papers. Here also his marriage took place. On the death of his patient about 1882 he returned to England and went to live at Southampton, but, finding it too far from London, after about two years he removed to Dartford. In 1885 he was invited to go to Cambridge as Curator of the University Museum. There he spent the next nineteen years of his life, till in 1904 he retired to Brockenhurst, where he had built a residence, Lawnside, on the very edge of the New Forest, facing the extensive heath of Black Knowl. Here he resided till his death on 27 August, 1922.

In 1862 Sharp became a Fellow of the Entomological Society of London and he was its President in 1887 and 1888, his presidential address being at the end of the former year on the subject of entomological collections, and of the latter on the senses of insects with special reference to that of sight. Between 1889 and 1903 he was on several occasions a vice-president, and he was on the Council from 1893-1895 and from 1902-1904. While living in London he was Secretary to the Society during 1867. In 1886 he became a Fellow of the Zoological Society, and he was on the Council from 1901-1905. The Linnean Society is also able to claim him as a Fellow since 1888; and he was connected by membership or correspondence with the chief entomological societies throughout the world. The high distinction of being elected a Fellow of the Royal Society fell to his lot in 1890, and the next year the University of Cambridge conferred on him the degree of Master of Arts, *honoris causa*.

David Sharp was the author of a very great number of papers and larger works. Being connected with the Entomologist's Monthly Magazine and the Entomologist, in either an editorial or a reference capacity, many of his numerous shorter papers appear in these magazines, and others in similar ones. Yet others, as well as some of his more pretentious papers, will be found in the transactions of societies with which he was connected. Perhaps his earliest contribution to entomological literature was a paper on the British species of *Agathidium* (Coleoptera) read before the Entomological Society of London on 6 November 1865. An interesting discussion on heredity and kindred subjects between Sharp and Wallace, arising in connection with Westwood's introduction of the subject of "mimicry" at the Entom. Soc. of London in November 1866, was reported in

the Athenæum of 1, 8, and 15 December 1866, and gives Sharp's views at the time on this subject. *A Revision of the British Species of Homalota* (Coleoptera) was published by the Entom. Soc. of London soon after his graduation at Edinburgh. In November 1873 appeared a paper in Spanish—*Especies nuevas de Colépteros* por Don David Sharp. This refers to insects collected by his friend G. R. Crotch, whose obituary notice Sharp contributed to volume xi of the Entom. Monthly Magazine. *The Object and Method of Zoological Nomenclature* appeared in November 1873. This is an important and well thought out paper on a debateable subject, the argument of which is perhaps summed up in the sentence, "Nomina si nescis, perit et cognitio rerum," which appears on the cover. A short paper on the *Coleoptera of the Scotch Fir* came out in the Scottish Naturalist about this time. The *Dascillide of New Zealand* was published in the Annals and Magazine of Natural History in July 1878; while work on the water-beetles was taken in hand for publication by the Royal Society of Dublin. Sharp and Fowler's *Catalogue of the British Coleoptera* appeared in 1893; the *Rhynchophorous Coleoptera of Japan* in 1896; the articles *Insecta* and *Termites* in the Encyclopædia Britannica in 1902; and an article on the *Orders of Insects*, a subject in which Sharp was much interested, in the Entomologist for 1909. The *Distribution of Plants and Animals on the Globe* (a paper read before the Dumfries Nat. Hist. Society in 1883); *Stridulation in Ants*, 1893; an *Account of the Phasmidæ*, 1898; and the *Grouse-fly*, 1907, are away from his special order—Coleoptera; while *A Scheme for a National System of Rest-Funds (or Pensions) for Working People* (1892) shows that Sharp could detach himself from entomology when he wished to do so.

We have still to notice the larger works, on which the author's claim to distinction chiefly rests. Papers on the Coleoptera of the Hawaiian Islands had been published by the Entom. Soc. of London in 1878, 1879 and 1880. These were followed in 1899 and 1908 by the *Fauna Hawaiiensis* brought out by the Royal Society. Of even more importance is the *Beetles of Central America*, prepared chiefly from material collected by Godman and Salvin, and published in 1894 and later years in that monumental work known as the "Fauna Centrali-Americana." In 1895 appeared the first volume of the *Insecta* in the Cambridge Natural History, this being followed by the second volume in 1899. Of their influence on the advancement of entomology, and especially of our knowledge of insects as living things, too much cannot be said. Their enormous sale has prevented the appearance of a new edition, which their author would have liked to bring out. One point especially which he wished to emend was the classification of insects into Natural Orders, his views and suggestions on which will be found in the paper in the Entomologist to which reference has already

been made. In 1910 the *Insecta* was translated into Russian. In 1912 the Entom. Soc. of London, with the assistance of the Royal Society, brought out as Part III of the Transactions *The Comparative Anatomy of the Male Genital Tube in Coleoptera* by Sharp & Muir, an exhaustive treatise of 166 pages, and 37 plates. All the families were examined, and the results of the multitudinous dissections are given in detail. This work is of first-rate importance.

Perhaps, however, the annual volume of the *Zoological Record*, published by the Zoological Society, is the work for which most credit should be given. This is a list of the publications for the year in all branches of Zoology, British and foreign, classified under the headings of author and subject. Sharp was editor for the whole and recorder also for insects. No one, unless he has seen something of the work involved, can imagine the amount of detail to be sifted, and the care and knowledge required to prevent errors. He entered on this work, which was to some extent a labour of love, in 1892, and his methodical treatment of the publication greatly improved it in every way. This work he continued till the year of his death, even completing the reading of the final proofs of records for 1920 during his last illness.

When quite young—about seventeen or eighteen—Sharp went with his father to Switzerland, and greatly enjoyed the trip. More than once in later days he went to stay with Oberthur in France. The loss of his friend G. R. Crotch, Librarian to the University of Cambridge, was a great grief to him. They had been closely associated in entomological work, and had made several excursions together—to the New Forest, to Rannoch, and to Spain. Sharp often spoke of the primitive conditions in years gone by to be found in the New Forest and in Scotland, and told amusing stories of their difficulties in the way of procuring food and lodgings. With another friend, Bishop, he visited Sherwood Forest, and the last letter he wrote during his illness was to this friend, who died only so recently as 26 August last.

Sharp knew most of the British naturalists of his time—Huxley, Bates, Wallace, Buchanan White, etc. He was a great friend of Spencer, and in 1904 wrote an article in the *Zoologist*, entitled *The Place of Herbert Spencer in Biology*, having particular reference to him in connection with the teachings of Charles Darwin.

In Brockenhurst Sharp worked assiduously with one of his daughters (now Mrs. Muir) in his entomological laboratory elucidating the life-story or the anatomy of numberless insects, chiefly Coleoptera, or adding to his extremely valuable collection of British beetles, which we understand passes to Mrs. Muir. His interest, however, seemed to grow less when working alone, especially during the last year or two of his life. To the last

Nature, whether exhibited on the animal or vegetable side, attracted him, and until a few months of his death he might be recognised by his rapid stride, slight stoop, and long white beard, as he took his almost daily walk into the Forest he loved so well.

W. J. LUCAS.

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

BY W. G. SHELDON, F.Z.S., F.E.S.

It has always been the case that those Lepidopterists whose names have come down to the present time, and who will live in the future through their entomological work, have possessed copies of the principal books their predecessors or contemporaries have written on the subjects of their studies. This must necessarily be the case with all who propose to do original work, because unless it is known what has been written by others, it is impossible to form an accurate opinion as to whether a particular fact or idea is new or not. In our own country all the great Lepidopterists of the past have possessed libraries, extremely complete ones many of them; J. F. Stephens, John Curtis, Stainton, T. A. Chapman, J. W. Tutt, Henry Doubleday, Edmund Newman and Lord Walsingham are a few who acquired every book they could meet with that would be of assistance in their studies; as an instance of this the library of J. F. Stephens in 1852, at the time of his death, consisted of 1150 volumes; it was purchased *en bloc* by Stainton, and the latter possessed many other books on entomology. The library of the late T. A. Chapman consisted of practically everything of importance that had ever been written on Palæarctic Lepidoptera, and must have consisted of at least 2000 volumes. The library, world famous, which was acquired by the late Lord Walsingham, is, of course, in the Natural History Museum. In addition to being practically complete so far as the owner's studies were concerned, it possesses many priceless unique gems, such as the original plates of Godart and Duponchel's great work. Even to those who do not aspire to do original work a library is an extremely desirable possession. It is not possible to get anything like the full amount of enjoyment out of one's study without one. For instance, I pick up a magazine and become interested in an article on a certain species. In this article the writer refers to an author on a point which can only be appreciated or understood by turning up the reference in that author; and when this has been digested it is often found that a further reference to another book is necessary; and before the point is satisfactorily dealt with some half-dozen books must be consulted. Now, how is one to get on unless all

these books are available to refer to? It is true there are certain public or semi-public libraries which can be referred to to a limited extent; but there are only two libraries in Great Britain possessing a practically complete entomological library—those of the British Museum (Natural History) and the Entomological Society; the former does not loan out books at all, and the governing body of the latter is compelled to prohibit the loan of its more valuable, and especially of its irreplaceable works; and thus many of the books one wants to consult can only be seen in the libraries, and cannot be removed: of course, the difficulty of consulting them even under these conditions is emphasised the further one lives from London. If we want, therefore, to consult the beautiful books—and many of them are extremely beautiful—that have been published in the last 200 years, the only recourse is to purchase as many as possible and to treasure them upon our bookshelves.

Unfortunately for themselves, and the science, many lepidopterists do not seem to know or appreciate the intense interest that can be obtained from the perusal of its literature. We have had men, quite a number of them, who would spend hundreds of pounds at a single sale of British Lepidoptera, and yet when their effects came into the market it was found they did not possess more than half a dozen books: every man to his taste, of course, but surely postage stamp collecting is at least as intellectual, and more useful, for there is some geography to be learnt thereby! I would like to suggest that before giving £15 or £20 for an aberration of a butterfly, it might be interesting, and even profitable, to ascertain if it is equally rare abroad as with us.

At the sale of the Farn Collection a black aberration of *Melanargia galatea* was described in the catalogue as unique; probably it was, as a Britisher; £32 was paid for it, but this form is by no means unique on the other side of the Channel! I could give other instances! To buyers of such I would commend a glance through the plates of such authors as Hübner, Herrich Schäffer, and Milliere; they might see something there that would interest them!

The present paper is an attempt to make the more important books and their present values better known, and, one hopes, more appreciated. It is obvious that in a magazine article only the more important books can be referred to for reasons of space, and that the particulars of these must be cut down as much as possible.

In the following list the prices I quote are based upon (1) either my own estimation of the current values of the works, or (2) the prices that have appeared in the catalogues of the second-hand booksellers. Unfortunately since the war very few of these catalogues have been issued, and in some cases I have

had to refer to catalogues dating from 1912 or 1913; prices since then have advanced 20 or 30 per cent. Whether these advances are permanent time alone can show, but it is certain that the older and rarer books are getting scarcer every year by absorption into the libraries of museums and other public institutions, both in this country and abroad, and especially in America. As I have previously pointed out on page 92 of the present volume, the result of recent sales by auction has been extremely disappointing. Entirely through the want of interest displayed by lepidopterists the dealers have been allowed to reap rich harvests, and have obtained extremely valuable books for a mere song, thereby realising in a few days a profit of, in some cases, 2000 or 3000 per cent.

In dealing with the books *seriatim* it will perhaps facilitate reference and lead to greater clearness if I arrange them alphabetically and keep those issued in each country together. But before doing this I would like to refer to two works of exceptional utility.

It is obvious that the first need of a student of the Lepidoptera is an efficient catalogue that will post him up in the particulars of books that have been published, and also of one that will give the references to everything of importance that has ever been written about each species.

The only book as a single volume, or rather two volumes usually bound together, that has ever been written on the bibliography of the science, is *Bibliotheca Entomologica*, by H. A. Hagen (Leipzig, 1862), an excellent and careful work that gives particulars of all works or papers of importance that had been written to that date. It is not an expensive work. My copy cost 15s. a few years ago; it is now priced at 20s.

There are, of course, the volumes of the *Zoological Record*, which I will deal with later on.

The bibliography of each species is described in *Catalog der Lepidopteren des Palaearctischen*, by Staudinger and Rebel, the 1901 edition (Berlin: R. Friedländer & Sohn), published at 12s., and probably still to be had from the publishers at about that figure. This is absolutely the most important book in existence for a student of the Lepidoptera of this region or of any part of it; one cannot move without it. There are errors, of course, plenty of them, but it gives us the references of the most important works dealing with the almost 10,000 species inhabiting the region. There are other catalogues in process of issue, but apart from the fact that they are very expensive, they are too fragmentary at present to be of much service to the student.

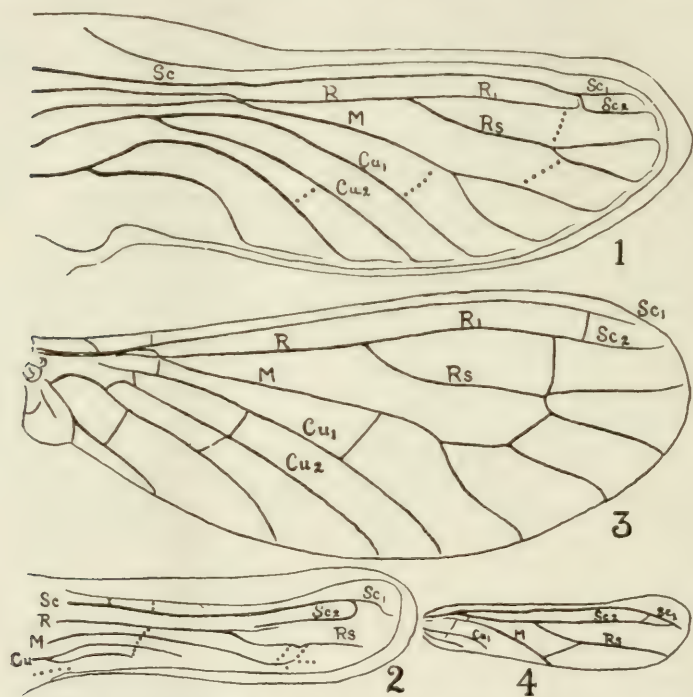
An extremely useful article entitled *The Present Prices of the Older Works on British Entomology*, by Mr. South, appeared in vol. xxxi, pp. 261-264, of this magazine; to this I refer my readers.

(To be continued.)

THE WING VENATION OF THE CONIOPTERYGIDÆ.

By C. L. WITHYCOMBE, B.Sc., F.E.S.

IN my last note on the Coniopterygidae I described the venation of the forms under consideration in terms of Comstock's system, applying such names to the wing veins as are given in his book *The Wings of Insects*. This was done for the sake of simplicity, while realising full well that some of the implied



Conwentzia psociformis.—Fig. 1 fore wing, fig. 2 hind wing of pupa $\times 66$; fig. 3 fore wing, fig. 4 hind wing of imago $\times 26$.

homologies were not exactly correct. Strictly, the venation is not so simple as at first sight appears.

I had then worked out the pupal venation of *Conwentzia psociformis*, Curt., and was hoping to complete my study with that of *Semidalis*, given by Comstock as typical of the Coniopterygidae. Unfortunately my larvæ of *Semidalis*, bred in captivity, are, I fear, not going to emerge this year as a second brood, probably as a result of the cold season. Therefore the venation of *Semidalis* cannot be settled this year.

The fore wing of *Conwentzia* is of fairly normal type, but the hind wing is strongly reduced, with correspondingly interesting results in the venation.

The figures will largely explain themselves, so that a detailed description is unnecessary. In the pupal wing the tracheæ of the future veins are shown as black lines. The pale vein cavities, visible in the pupal wing but lacking a trachea, are shown as dotted lines. These, of course, should appear in the imaginal wing as veins, though sometimes difficult to see. The figures of pupal wings are drawn to a larger scale than the imaginal wings.

Comparison of the fore wings of pupa and imago shows that the apparent cross-vein between Sc and R_1 is really Sc_2 , and the terminal portion of apparent R_1 is also Sc_2 . The trachea of R_1 ends by bending anteriorly along the cross-vein, and does not continue to the outer margin. No other cross-veins in the wings are preceded by tracheæ. Another interesting point in the venation of the fore wings, in all Coniopterygids, is the apparent crossing of radius and media in the basal fourth of the wing. From the pupal venation this is seen to be only an approximation of the two veins, which then diverge.

The hind wings are very peculiar, and in the pupa appear to promise a more complex venation than actually matures. Sc and R_1 apparently coalesce at their extremities. This is not truly so. R_1 often does not exist in the pupal wing, its place here being taken by the recurrent Sc_2 . More usually, however, R_1 has been found present, though short and weak. The radial sector is well developed, and its trachea is bent slightly at the future point of junction with the cross-vein to media. The media is unbranched. Cu_1 and Cu_2 are both present, but although the pupal wing shows a pale channel for an anal vein, there is no trachea to be seen within it.

The main interest of the venation is the bifurcation of the subcosta. The presence of Sc_1 and Sc_2 is generally regarded as primitive, and since the Coniopterygidæ are admittedly archaic in many respects, though highly specialised in others, this additional primitive character is of interest.

Walthamstow;

August 26th, 1922.

TROIS LEPIDOPTÈRES NOUVEAUX DE LA RIOJA, RÉP. ARGENTINE.

PAR E. GIACOMELLI.

1. *Psectrotarsia tamsi*, sp. nov.

Port et taille de *Psectrotarsia fuscirena*, Hamps. Côté supérieur : Primaires d'une couleur verte ochracée claire tendre, tout uniforme. Les secondaires blanches, avec une bande brune au bord, suivante parallèlement à toute la frange ; cette bande disparaît dans quelques

exemplaires. Franges blanches. Tête et thorax de couleur verdâtre très pale comme les primaires. *Côté inférieur* : Toute la surface des ailes est blanche, unicolore. Palpes, pattes, abdomen, inférieurement blanc, ce dernier supérieurement blanc jaunâtre crétacé. Yeux gris, antennes jaunâtre clair.

Exp. alar. ant. 28 mm.

Quelques exemplaires de la Rioja (R. Argentine). Usine de la lumière électrique. Il ne semble exister de différence marquée entre le ♂ et la ♀. États préparatoires inconnus pour moi.

J'ai le plaisir de dédier cette espèce à mon ami distingué, Mr. W. H. T. Tams, du British Museum.

2. *Thyreion riojana*, sp. nov.

Un peu plus petit que *Thyreion circumfusa*, Dogn., et d'une stature plus gracieuse. L'espèce semble variable, quelques exemplaires sont supérieurement presque uniformes, jaune clair, crétacée, presque blanc. Dans quelques exemplaires (♂ ; ?) les secondaires deviennent grisâtres, fumeuses, et on observe une ligne de points très fins, parallèle au bord extérieur, nets, mais à peine visibles. Le côté inférieur est blanc à peine jaunâtre, uniforme, sauf une tache triangulaire fumeuse qui part de l'angle intérieur et se repand vers le bord externe plus ou moins marquée selon les exemplaires.

Corps, antennes, pattes et abdomen blanc jaunâtre comme les ailes.

Exp. alar. ant. 22-23 mm.

6 exemplaires chassés à la lumière électrique, La Rioja (R. A.). États préparatoires inconnus pour moi.

3. *Tolyte fumosa*, sp. nov.

Couleur du fond, légèrement rougeâtre ou rouille, presque cachée par les dessins noirs. Les ailes sont gris fumeux, plus dense vers le bord antérieur et à l'angle postérieur des 2^{mes}. Cette couleur de fumée est formée par des lignes peu voyantes qui partent du bord antérieur vers le postérieur, dans lesquelles s'en détachent principalement deux plus nettes au première et 2^{me} tiers basale. Tête, thorax et abdomen supérieurement de la même couleur fumeuse encore plus intense, surtout sur les pterigodes. Sur les ailes les nervures se détachent assez clairement.

Côté inférieur du corps et ailes aussi fumeux, les primaires légèrement opalines vers le bord externe, les secondaires au centre ; l'abdomen blanchâtre inférieurement. Antennes jaunes, yeux bruns.

Exp. alar. ant. 21 mm.

Les 4 ♂♂ chassés à l'Usine de la lumière électrique, de La Rioja, présentent des légères différences individuelles, deux tendent plus à la couleur de rouille, que les autres deux plus fumeux.

Nous possédons un exemplaire un peu plus grand (32 mm. exp. alarum), que nous jugeons être la ♀ des antérieurs. Elle a

absolument le port et le dessin de notre *Tolyte bipunctata*, Giac., décrite en *Lepidopteros riojanos nuevos o poco conocidos* (Anales Soc. Cientif. Argentina, T. lxxii, pag. 19, Año 1911), mais la couleur générale est fumeuse, presque noire, semblable aux ♂ ♂ ici décrits. Elle possède bien marqués les deux points caractéristiques de *bipunctata* dans la même position; peut-être *bipunctata* et cette ♀ pourraient être deux formes de la même espèce.

Cette ♀ a été chassée dans le même endroit que les ♂ ♂ décrits. États préparatoires inconnus.

La Rioja,
Rép. Arg.

OBSERVATIONS ON THE BIOLOGY OF SAWFLIES.

BY A. D. PEACOCK, M.Sc.

THE following notes are summarised from observations extending over the period autumn, 1920, to autumn, 1921, the flies being reared in the laboratory from larvæ usually collected in the field. Unless otherwise stated, the imagines were fed on a syrup of sugar and water, which was almost invariably accepted, given access to water, and provided with a twig of their natural plant in water or with a potted plant. Plant and insect were caged in a large glass bell-jar or other suitable glass vessel. I am greatly indebted to Miss E. F. Chawner for certain larvæ, and for giving me the benefit of her wide experience in rearing sawflies. My thanks are due also to the Rev. F. D. Morice, M.A., for the identification of the adult insects.

PARTHENOGENETIC SPECIES AND THE RESULTS OF THEIR EGG-LAYING.

The names of the experimental insects are according to Enslein's list (1), and for convenience the genera are arranged in alphabetical order.

**Allantus (Emphytus) serotinus* Müll.—Specimen 1: 6 eggs laid; hibernating 1921–1922. On oak.

**Allantus (Emphytus) pallipes* Spin.—All appear fertile; produced females only. On violet and viola.

Nematinus fuscipennis Lep. (*abdominulis* Panz.).—Specimen 1: 5 larvæ from 10 egg-holes. On alder. Specimen 2: 9 larvæ from 24 egg-holes; failed to rear the larvæ. On alder.

**Nematinus luteus* Panz.—Eggs (a few) which failed to hatch. On alder.

**Pachynematus obductus* Htg.—All eggs laid appear fertile; larvæ hibernating 1921–22. On *Poa* sp.?

Pristiphora pallipes Lep.—All eggs appear fertile; two broods of larvæ reared during the summer of 1921 yielded all females; from Miss Chawner's experiments, 1920–21, it is possible that

the rarer male may appear in the spring after hibernation. On gooseberry.

**Pristiphora ruficornis* Ol.—All eggs appear fertile; failed to rear larvæ. On hawthorn.

Pteronidea pavida Lep.—Specimen 1: All the 62 eggs collapsed and did not hatch. On willow. Specimen 2: A batch of 56 eggs; all except 1 fertile; larvæ hibernating 1921-22. On willow.

**Platycampus luridiventris* Fall.—Specimen 1: 2 larvæ from 7 egg-holes; failed to rear. On alder.

I failed to obtain parthenogenetic eggs from 5 specimens of *Amauronematus vittatus* Lep., using alder and birch, the plants upon which the larvæ had been found and reared. I am investigating the matter of food-plants of this species, which is regarded as attached to willow.

The specimens starred are not recorded as parthenogenetic in the lists of Cameron (2) and Enslin.

Regarding the alder species *N. fuscipennis*, *luteus* and *P. luridiventris*, which lay deeply in relatively hard plant-tissue, it is impossible to say whether each egg-hole made contained an egg or not. From my observations on the insects while they went through this performance, however, I should say that each hole did contain an egg.

NUMBER OF PARTHENOGENETIC EGGS LAID AND THE RATE OF LAYING.

Species.	Total laid per insect.	Individual rate of laying.
<i>A. serotinus</i>	6	. 3 in 7 days; 4 in 10 days; 6 in 14 days.
<i>A. pallipes</i>	—	. Spec. 1: 12 in 30 minutes.
	—	.. 2: 3 " 30 "
	—	.. 3: 8 " 30 "
	61 from 2 flies	. Specs. 1 and 2: 61 in 6 days.
	55 " "	.. 3 " 4: 55 " 5 "
<i>N. fuscipennis</i>	6	. Spec. 1: 6 egg-holes in 24 hours.
	10	.. 2: 10 " 15 "
	25	.. 3: 25 " 24 "
		(In the green stalk of leaf, egg laid in 4 minutes; in harder brown stalk, 7 minutes.)
<i>N. luteus</i>	—	. Spec. 1: None.
	20	. Spec. 2: 12 egg-holes in 24 hours; 20 in 48 hours.
<i>P. obductus</i>	20	. Spec. 1: 6 in 24 hours.
	10-12	.. 2: 10-12 in 7 days.
<i>P. pallipes</i>	. 80 from 3 flies	—
<i>P. ruficornis</i>	16	—

Species.	Total laid per insect.	Individual rate of laying.
<i>P. pavida</i>	57	. None in 4 days; 6 after 4 days; 51, laid in about 10 hours, after 5 days.
<i>P. luridiventris</i>	—	. Spec. 1: 7 egg-holes in 4 days. " 2: 3 " 5 " (In green stalk of leaf, egg laid in 3-5 minutes.)

PROMPTITUDE IN LAYING AND RELATION TO FEEDING.

In all the succeeding cases, except where otherwise stated, the flies were obtained a few hours at most after emerging and then given opportunity to feed on sugar syrup.

A. serotinus.—A single specimen laid after 7 days.

Allantus pallipes, and *Pristiphora pallipes*.—Both these laid immediately after hatching and feeding. They also laid normal eggs in the normal fashion without feeding. In these latter experiments moisture in the form of condensation on the glass cage was available but whether it was taken or not was not observed.

N. fuscipennis.—In two experiments the flies were kept fasting with their host plant, alder, for 4 and 5 days respectively. Neither laid. But immediately after a feed of sugar syrup both commenced laying.

N. luteus.—One specimen produced eggs one day after emerging and feeding, but another, despite frequent meals, never laid.

P. obductus.—One specimen laid almost immediately after emergence and feeding while a second delayed for about a day.

Explanation of the complete failure to hatch of the eggs of *Nematinus luteus* and *Pteronidea pavida* I am unable to offer.

EMERGENCE OF ADULTS.

Premature emergence.—In three instances this phenomenon has been observed. About the end of May, 1921, a caterpillar of *Allantus serotinus*, a non-spinner, went to ground in a litter of peat, sand and coconut fibre. On June 4th it was placed in a small corked bottle under about $\frac{3}{4}$ in. of litter. Three months later, September 2nd, a green male pupa was found on the surface, where it remained on its back for 16 days when it became active. Two other specimens did not emerge from litter till ready for adult life.

The second case concerned *Pteronidea pavida*, which went into the litter to spin about July 15th. The cocoons were kept under conditions similar to the above. A month later, August 15th, a light green male pupa appeared on the surface and lay there for 8 days before becoming active. Five other specimens behaved normally.

About July 12th specimens of *Pachynematus obductus* went into litter, spun cocoons and kept as noted above. On July 25th a green female pupa was found on the surface, where it lay 2 days before adult activity. No other specimens behaved so.

These laboratory results are too insufficient to warrant much comment. In no case was the metamorphosing insect disturbed. The appearance of *A. serotinus* on the surface could be explained on the grounds that the pupa, unencumbered by a cocoon, by its wriggings—pupæ at times do wriggle vigorously in a corkscrew fashion—managed accidentally to reach a higher level. But in the other two cases explanation is not so ready because the specimens belong to cocoon-forming species. Unfortunately my notes do not record any facts as to the condition of the cocoons, so the significance of these emergences remains obscure. Either the specimens spun feebly, in which case the cocoon-spinning instinct is liable to vary, or the pupæ were able to free themselves prior to adult activity. If the former happened emergence could be explained by pupal wriggling; if the second, the conditions governing emergence required further investigation. Under natural conditions, unless some superficial shelter were obtained, this faculty would be of very doubtful survival value to the individual or species. The phenomenon does not appear to be sexual. MacGillivray (3), whose papers came into my hands since writing these notes, has already had similar experience, on which he writes: "Just before they are ready to cast their larval skins and become pupæ, they may leave their cocoons or earthen cells or tunnels in rotten wood and force themselves to the surface of the soil, where they will remain as if dead, only wriggling the body when disturbed. Such may pupate . . . and produce adults or they may die." As I only observed pupæ on the surface, I cannot give any information regarding the behaviour of the larvæ.

Emergence of the sexes.—Attention in the following instances has been confined to experiments in which I have reared the insects from fair numbers of eggs or larvæ. The number of emergences, however, is somewhat small. Females emerging first: *P. parida*, 4 females out August 7th to 14th, 1921, then 4 males August 15th to 26. *P. luridiventris*, 4 females out June 18th to July 4th. No males. There is good reason for thinking that *N. fuscipennis* and *A. vittatus* behave similarly. Males emerging first: *A. serotinus*, 2 males out September 18th, 25th, 1 female October 5th. *P. ruficornis*, 1 male July 13th, 2 females July 15th, 19th. *P. pallipes*, 1 male April 3rd. First females June 21st. (Miss E. F. Chawner's experiment.)

SEXUAL BEHAVIOUR.

While visiting the Edinburgh Botanical Gardens on September 7th, 1921, a very hot day, a large number of *Athalia*

lineolata Lep. were observed swarming in the sun over beds of *Ajuga reptans*. The great majority were males, but couples were observed in copulation. Two females and eight males were captured, placed under a glass jar covering a patch of planted *A. reptans*, and observed for a week. Copulation occurred at intervals, and lasted for at least some minutes. No eggs were laid—I was unaware then that the species lays on oak—but this did not seem to affect the mating process. Polyandry was not observed, but I think it very probable.

Pristiphora ruficornis.—In one experiment a single male and female kept in a large glass jar with a hawthorn twig for four days, and given opportunity to drink and feed, were never observed to mate.

Amauronematus vittatus.—Mating was not observed, during observation lasting one hour, of flies in a small glass vessel which capped a small alder twig.

REFERENCES.

(1) ENSLIN, E.—“Die Tenthredinoidea Mitteleuropas,” Deutsche Ento. Zeit. Jahrgang, 1912–17.

(2) CAMERON, P.—Phytophagous Hymenoptera.

(3) MACGILLIVRAY, A. D.—“The Immature Stages of the Tenthredinoidea,” contribution from the Ento. Labs. Univ. of Illinois, U.S.A., No. 38, and papers from the Maine Agric. Expt. Stn., Ento., No. 70.

Armstrong College,
Newcastle-on-Tyne;
February 7th, 1922.

NOTES AND OBSERVATIONS.

NEW NAMES FOR OLD.—In February, 1910, I published in Trans. Linn. Soc. (2nd ser., Zool.), vol. xiii, pp. 304–305, the description of a Pyralid moth from Praslin, Seychelles, under the name *Nacoleia maculalis* Fletcher. As I now find that my name is an absolute homonym of *Nacoleia maculalis* South (Trans. Ent. Soc., 1901, p. 462, t. 14, f. 7), described from Central and Western China, the Seychelles species may be renamed as *insulicola* **nom. nov.** The generic name *Nacoleia* Wlk., 1859, is ante-dated by *Lamprosema* Hb., Verz., p. 361, 1826.

The generic name *Arbela* Moore (P.Z.S., 1879, p. 411), in Lepidoptera, is a homonym of the Reduviid genus *Arbela* Stål (Hem. Afr., iii, pp. 38–42, 1865). In vol. i on moths in the Fauna of British India, p. 314, 1892, Sir George Hampson founded the family Arbelidæ on *Arbela* Mo., but this family name has since been changed to Teragridæ, founded on *Teragra* Wlk., the first described genus contained in it. The African genus *Teragra* is, I believe, not identical with the Indian genus *Arbela* Mo., which is now renamed *Indarbela* **nom. nov.**, type *tetraonis* Moore.—T. BAINBRIGGE FLETCHER; Pusa, India, July 31st, 1922.

NOTES FROM THE ALTON DISTRICT, HANTS (LEP.).—On June 10th there emerged from a mixed lot of pupæ *Hydrelia uncula*. As I had no marsh larvæ or pupæ, the only explanation possible is the following: The preceding autumn, passing the swamp near Oakhanger,

I filled my pocket with a couple of handfuls of clean sphagnum. This reposed in a box on top of a bookcase all winter, exposed to heat and fumes of gas in a sitting-room. In the spring I wrung it out in very hot water and used it to bed some wintered pupæ on. A few evenings after the emergence I went down to the swamp to see if *H. uncia* occurred there, and, sure enough, a few specimens were flying. It is amazing that a pupa, accustomed to lie in a freezing marsh all winter, should endure such treatment. And what physiological mechanism secures that after all it should emerge at precisely the usual season? It is particularly exasperating when one finds that choice pupæ refuse to live through the winter in the most skilfully contrived cold storage. Another surprise was *Dianthacea conspersa*. In 1920 I collected larvæ from *Siene* which produced a series of *D. carpophaga* in 1921. I took no more in 1921, so that *D. conspersa*, a species I had not met with here, must have lain over a year. This is the more surprising as the genus tends rather to be double-brooded than to lie over. I may say that here *D. cucubali* always appears as a second brood: even in this miserable summer it turned up on August 14th. *D. carpophaga* is, I think, single-brooded here: and *D. capsincola* is a rarity with me, of which I cannot speak. The third surprise concerns *Trochilium crabroniformis* (surely it should be *crabroniforme*!). Their borings are very numerous in our woods, and I secured three stumps this spring. The first emergence was a number of ichneumonids, so that my expectations were reduced to two. But to my surprise three imagines emerged. Investigation of the stumps showed that two larvæ had pupated in one boring, and had presumably only the one exit. Had they spent their whole larval life in the same bore, which was only wide enough for one? I suspect that No. 1 made an exit hole and pupated, and then No. 2's bore converged on No. 1's (like the arms of a letter Y), and he proceeded to pupate between No. 1 and his exit. Fortunately No. 2 emerged first, and so cleared the way for No. 1, who would otherwise have been bottled up. Mr. Atkins, the woodman who brought me the stumps, is a keen observer, and informs me that he captured a large moth in a recent year which he identified as a "Clifden nonpareil." He is probably right, as it is difficult to mistake *Catocala fraxini*, but I wish he had kept it. As regards the season, the most notable feature among the butterflies is the abundance of the second brood of *Cyaniris argiolus*,† which has been about all through August and is flying in my garden to-day (September 11th). It seems clear that unusual heat early in the season sets a second brood on the way, and no subsequent cold can arrest it. July and August this year were far below the average in temperature, but *Demas coryli* came to light May 31st and August 9th, and its small larvæ and those of the "Prominents" are as numerous as usual. *Colias croceus* and *Pyrameis cardui* are present in fair numbers apparently—when the weather permits them to fly. When the weather broke at the end of June sugaring was very profitable for a time, and in a lesser degree throughout July.

* Lewin's original spelling of the name in Trans. Linn. Soc., iii, p. 1. 1797. is *crabroniformis*.—N. D. R.

† This appears to have been very general. I have never before seen it so abundant in the south-west district of London.—N. D. R.

The best additions to the Alton list were *Cosmia pyralina* and *Palimpsestis octogesima* in single specimens, with *Noctua stigmatica*, etc., and a beautiful series of *Eurois prasina* in very fresh condition. In every season one or more species of the commoner Lepidoptera is apt to predominate in numbers to an unusual degree. This season I was struck by the exceptional numbers of *Ligdia adustata* in May. The puzzling thing about this insect is the apparent discrepancy between its abundance and the scarcity of its food-plant. I had the curiosity to examine the hedges of a lane where it flew out of every bush one tapped, and in a quarter of a mile I could only detect two scrubby little bushes of *Eunonymus*. Other unusually abundant species were *Euchelia jacobaeae* and *Leucania conigera*—the latter a perfect pest at light and at flowers in the garden. On the other hand, I have seen but one single specimen of *Spilosoma lubricipeda* in four years here! Can it be growing scarce? *S. menthastris* turns up at light as usual. It would be interesting to learn if others have had the same experience, or if the scarcity is merely local.—E. A. C. STOWELL; Alton, Hants.

NOTES FROM E. KENT (LEP.).—*Melitaea athalia*: Visiting a home of these insects on June 13th I found larvæ in plenty, nearly full-grown, also plenty of pupæ; on the same day imagines were on the wing. I netted about three dozen; all being typical I retained none. On June 24th I took a nice variety; the anterior wings have a small patch of brownish-orange at the basal area; the centres are obscured by a deep black band three-eighths of an inch wide at the costa, extending across to the dorsal margin, followed by six deep orange marks forming a narrow band; the outer margin has a deep black band one-eighth of an inch wide with usual fringes. The specimen is otherwise normal. I do not think this variety is mentioned in South's British Butterflies. *Colias croceus* (*edusa*): First noticed here on July 30th, when four specimens were taken. Between that date and August 20th ten others, including one var. *helice*, occurred. In 1921 I took thirty-two *C. hyale*, but saw no *croceus*. This season I have seen no *hyale*. *Sphinx convolvuli*: September 1st a large ♂ in fine condition was found in garden, resting during daylight, on foliage of *Nicotiana affinis*. On September 2nd a ♀ was netted at dusk hovering over the same plant. September 3rd, ♀ at dusk and two others seen. September 5th, one ♂ and one other seen. September 11th, netted a large ♀ very much worn.—H. G. GOMM; Westbrook, Margate.

COLIAS CROCEUS AND OTHER LEPIDOPTERA IN CUMBERLAND.—On August 29th I was shown a living specimen of *C. croceus* by the inevitable small boy, who had taken it about ten minutes previously and asked me if I could identify it for him. On September 1st and subsequent dates my son and I obtained specimens, all of which were in very beautiful condition. These were all netted on the shores of the Solway, and they appear to be confined to a very restricted locality; they were generally flying among the marram grass a short distance above high-water mark; we found none in the clover fields. *Hipocrita jacobaeae* used to be found in a few restricted localities in this county, but has gradually disappeared from them, and appears to have approached extinction. We found, however, the larvæ swarming

on ragwort at the commencement of September. They appeared to be confined to a patch of about five or six acres, and, though we searched the surrounding moorland carefully, we found none. This is singular, as the surrounding country does not vary in character, nor is the ragwort less plentiful. I had the opportunity of observing an ichneumon at work among the larvæ. She settled on the same leaf as her victim and alongside it: then her ovipositor suddenly flashed out twice. The larva appeared quite unconscious of the attack. One other capture is, I think, worth recording. Last winter I dug a pupa of *Odontostia carmelita* in a wood about three miles from Carlisle from which a perfect female emerged in May. The only other county record that I am acquainted with is the occasional appearance of this species at Keswick, some thirty miles away. — HAROLD D. FORD; Thursby Vicarage, Carlisle.

COLIAS CROCEUS, ETC., IN DERBYSHIRE.—On October 30th, 1921, I chased a male *croceus* for some distance, but failed to capture it. On August 6th, 1922, I captured a female specimen evidently freshly emerged, and saw a second on August 31st on the Duke of Devonshire's land at Hardwick Park. At Ridgeway, near Sheffield, I saw a specimen on August 13th, and have also seen odd specimens in other areas as follows: Croxteth Park, Liverpool, May 25th; and in a hay-field a few miles north of Worcester on August 1st.

Referring to the recent notes in the Entomologist on possible hybridisation in nature, it may be of interest to note that on August 26th I found a female *Pieris brassicae* in cop. with a male *P. rapae*. These I brought home in a tobacco box in which they became separated. I kept them in a gauze cage over a growing cabbage plant, but they did not repeat the operation, neither did the female lay any eggs prior to her accidental release.—A. W. RICHARDS: High Street, Tibshelf, Derbyshire.

COLIAS CROCEUS IN NORTHUMBERLAND.—To the references to the occurrences of the clouded yellow in southern England this season, which have appeared in the Entomologist, it may be worth while to add that one was seen at Nunwick, Northumberland, on August 25th.—GEORGE BOLAM; Alston.

COLIAS CROCEUS IN LANCASHIRE AND WESTMORLAND.—Though this species occurs in this district only at rare intervals, it has spread this season as far north as Witherslack (Westmorland). I received on September 6th a ♂ which was taken there two or three days before. The specimen was in such fresh condition as to lead me to believe it had emerged in the locality, and the following day (September 7th) I visited the stretch of shore between Lytham and St. Anne's (Lancs) in the hope of seeing something of the species, and was rewarded by the capture of a fine ♀, the only one seen.—T. M. BLACKMAN; 27, Black Bull Lane, Fulwood, Preston.

COLIAS CROCEUS IN HUNTS.—I saw a male of this species flying high in Brampton Park on May 31st last, and several specimens were noted by other observers in the immediate neighbourhood. It was, therefore, no surprise to me to catch a freshly-emerged specimen at Spaldwick on August 5th. Since then I have captured nine others, including three worn males yesterday, in the same village

and at Brampton. I should no doubt have taken more but for the continued absence of sunshine, and the scarcity of clover and lucerne fields in this county.—(Rev.) GILBERT H. RAYNOR; Brampton, Huntingdon, September 9th, 1922.

COLIAS CROCEUS IN HANTS.—This species has been fairly abundant on the Portsdown Hills; I have seen about 150 in all. The first seen was on July 29th, which is rather earlier than usual. Females have been scarce, and only one var. *helice* has been taken by me, though I have heard of four others being captured. On September 11th, the last date I have been to look for them, I counted fifty-four.—(Rev.) J. E. TARBAT; Fareham.

POLYGONIA C-ALBUM, ETC., IN BERKSHIRE.—Since reporting the appearance of *Polygonia c-album* in this locality (Wallingford district) on July 12th of last year (Entom., liv, p. 243), it may be of interest to report that I have found single specimens since on the following dates: September 3rd, 1921; May 16th, 1922; and August 18th, 1922. There is reason therefore to think that this insect has established itself here, following the migratory influx which apparently took place in the spring of 1921. I was interested to hear of Mr. G. B. Oliver's attempt to introduce *Agriades bellargus* (*adonis*) in the Chilterns. I hope the experiment will prove successful. On August 20th I spent the day on the edge of the Chilterns between Wallingford and Nettlebed (my only visit this year). Though a dull day butterflies were plentiful, but sluggish owing to the absence of sunlight. *A. corydon* was common and in splendid order. *Colias croceus* was also to be found here and there among the clover-fields. *Melanargia galatea* was as usual fairly abundant, though not now in the best condition. *Aricia medon* (*L. astrarche*), common. I have been away most of this summer, and consequently devoted but small time to entomological pursuits. *Agrotis obscura* was common here at Shillingford at the end of June and beginning of July of this year. I found several at "honey dew" on the rose trees, and many others caught in spiders' webs in our loft, where they had been entrapped while seeking out the "honey dew" on the rose tree just outside. I have not seen this *Agrotid* before in this part of the country.—MORRIS BOORNE; Shillingford, Wallingford, Berks.

POLYGONIA C-ALBUM IN HERTS.—In connection with Mr. Tite's capture of *P. c-album* at Tring on May 6th (Entomologist, June, 1922), I should like to record that I captured a specimen at Wendover on July 31st, 1922. This surely belonged to the summer brood—hardly expected in such an unfavourable season. They have also occurred lately at another spot near Tring, the latest capture being on August 26th, 1922.—R. B. BENSON; Boldre House, Charles Street, Berkhamsted.

THANAOS TAGES: SECOND BROOD.—Two specimens were taken, and a few others seen, on August 26th, on the South Downs, near Winchester.—FREDK. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

MANDUCA ATROPOS IN BUCKS.—On August 1st I visited the Bucks Chilterns. Here I was informed by a countryman that he had

caught a specimen of *Manduca atropos* a few weeks previously. The moth had been taken at rest in the daytime.—J. A. BROWN; "Keston," Whitechurch Lane, Edgware, Middlesex.

[Two full-grown larvæ of this species were received by the Entomological Department of the British Museum on August 23rd for identification. They had been found by Mr. D. Jones on jasmine at Stony Stratford.—N. D. R.]

HYLOICUS PINASTRI IN SUFFOLK.—Between August 1st and August 16th I took sixteen specimens of *Hyloicus pinastri* in the Saxmundham district, Suffolk. I found them all by searching pine trunks, on which they show up quite clearly, even when seen from some way off. The greatest height at which I noticed the insect was rather less than five feet up a trunk; the average height was between two and three feet; in several cases the moths were almost on the ground. They could, without exception, have been seen by viewing the trees from the south-east; sun and wind do not seem to affect them; the north side failed to produce even a single specimen. It is unnecessary to search the trunks closely, for *pinastri* can be seen at a glance (if there is one to be seen). Its occurrence appears to be very "patchy"; where one is detected it is probable there will be others.—M. MACTAGGART; Moorcroft, Gravel Hill, Bexley Heath, Kent.

HERSE (SPHINX) CONVULVULI AT EASTBOURNE.—On the evening of August 26th, at dusk, it being almost calm and fairly warm at the time, I noticed a large Sphingid hovering at a poppy flower that was growing in proximity to a patch of tobacco blossoms in my garden: I had no doubt as to it being *H. convulvuli*, but by the time I had obtained a net it had gone. On the 29th another eluded me. On September 1st I captured two which proved to be, as I expected, this species; on the 2nd three were seen and two of them taken, one of them at the time of capture feeding at blossoms of sweet pea, but all the others seen were at the tobacco blossoms. On the 3rd the moon was very bright and a light northerly breeze was blowing, and the only two or three seen dashed wildly about the blossoms without attempting to feed. The evenings of the 4th and 5th were overcast, and on each of them a capture was made: the 6th was bright moonlight and the wind well in the east, and the only moth seen flew wildly, and this was the last seen of the species. The patches of tobacco blossom worked were scattered over a considerable area, and, as a moth seldom stays very long at any one lot of blossoms, it is probable that the species has been really more common in this neighbourhood than the half dozen captures would suggest.—ROBERT ADKIN; Eastbourne, September 16th, 1922.

HERSE CONVULVULI IN LONDON.—On September 7th I had an urgent request for a killing-bottle from my friend, Mr. Holmes, of 32, Felday Road, Lewisham. The previous evening his mother had knocked something off a statue in their garden which seemed to be alive, and, seeing it was a large moth, put it in a glass jar. It turns out to be a fine female specimen of *H. convulvuli*.—J. H. VICKERS; 16, Talgarth Mansions, Barons' Court, London, W.

HERSE (SPHINX) CONVULVULI IN CAMBRIDGESHIRE.—*Sphinx convulvuli* is somewhat abundant here this year. I have taken nine specimens in good condition in my garden on *nicotiana*, from August 30th to September 6th, when I ceased taking them. They were all but one taken between 8 and 11 o'clock at night. One was taken in the twilight, but that was the only occasion on which I went out before 8 o'clock. I was never out after 11 o'clock. I still see one or more almost every night at various times between 8 and 11 o'clock. Their apparent curiosity mentioned by Barrett in his British Lepidoptera was very noticeable. Usually when the light was thrown on them they became fidgety, and some left the flowers and flew backwards and forwards a yard or two from me several times, and then a few times at a rather greater distance, and then went off; but sometimes they returned at once to the same bed of flowers. A white straw hat I sometimes wore seemed, on several occasions, to be of great interest to them, and they flew round it and within a few inches several times before going further away. They were all males but one. I also took a rather worn male here last October at rest on a curtain in the billiard-room. The specimen recorded as taken here in June was also a male. This sex this year seems to predominate largely. The times above mentioned are times according to the sun (Greenwich time), and not the statutory summer times.—A. HAROLD RUSTON; Aylesby House, Chatteris, Cambridgeshire.

HERSE (SPHINX) CONVULVULI IN SCOTLAND.—I have just seen a specimen of this species, rather small but in good condition, taken by Mrs. Douglas Mackay in a garden at Aberfeldy, Perthshire, on September 6th.—W. BOWATER; Highfield Road, Edgbaston, Birmingham.

HERSE (SPHINX) CONVULVULI IN AYRSHIRE.—On September 5th, 1922, I found a specimen of this moth lying on its back on the road, alive but headless.—IAIN D. JEX LONG; 46, Eglinton Road, Ardrossan, Ayrshire.

CATOCALA FRAXINI IN EAST KENT.—On Sunday, September 17th, whilst visiting the "sugared" leaves of lime for *Cirrha citrigo*, I was astonished to find *Catocala fraxini* on a leaf. The insect was taken at Stowting, about six miles from Hythe, and, judging from its perfect condition, seems to be a locally hatched specimen.—C. A. W. DUFFIELD; Pickersdene, Brook, near Ashford, Kent.

STERRHA SACRARIA IN DEVON.—A perfect male specimen of this interesting migrant was taken on August 7th at Efford Fort, Plymouth, about 6.30 p.m. The insect was actually disturbed by my son, Howell Peach (aged 9), who saw it fly into a tuft of grass and called my attention to it. The oblique bar is pink.—A. H. PEACH; 48, Whiteford Road, Mannamead, Plymouth.

[A similarly pink-banded male was taken by Dr. W. D. Lang this year on May 31st at Stonebarrow Cliff, Charmouth, and presented to the Natural History Museum.—N. D. R.]

EUPITHECIA TRISIGNARIA IN DERBYSHIRE AND NOTES FROM N. STAFFS.—I have much pleasure in recording the capture, on May 27th, of a female *Eupithecia trisignaria* in a wood near Ellestone,

which is only about 100 yards over the Derbyshire border, the insect never having been taken in North Staffordshire before. The nearest recorded captures are Market Drayton and Repton. Could any reader of the *Entomologist* tell me if the following variety of *Euchloe cardamines* has been named. In all cases but one that I have seen the insect is of typical size and has the ordinary markings, but, in addition, a distinct black spot on each hind wing. The exception, however, is a ♀ of the *hesperidis* form, which is absolutely ordinary with the exception of very heavy basal spots on the fore wings and the same curious black spots on the hind wings. This is certainly no fresh occurrence, as the following dates of occurrence indicate: ♀ *f. hesperidis*, Denstone, June 4th, 1922; ♀, Denstone, during May, 1922; ♂, Dovedale, by Mr. T. Smith, during June, 1920. Also there is one ♀ in the Daltry Collection without data. I should be interested to hear if other specimens of this variety have been taken. The extraordinary large number of *Pieris napi* of the *sabelliae* form that have been flying in this district this year also is worthy of record. Nearly 25 per cent. of the *P. napi* flying in May were melanic.—GUY STANTON; Denstone College, Rocester, Staffs.

A RECORD CAPTURE OF BLUES (*antea*, p. 211).—On August 29th I went to a clover field at the foot of Wolstonbury Hill (Sussex Downs) to look for *C. croceus*. At one spot in the rough grass margin of the field, covered with flowering knap-weed, thistles, ragwort, etc., and bounded by a hedge of holly, privet and whitethorn, we netted *six* species of blues within a few paces. They were *L. astrarche*, *icarus*, *bellargus*, *coridon*, *argiolus*, and *minima*. This, I think, goes one better than your correspondent.—(Major) J. J. JACOBS: Holmesleigh, Burgess Hill, Sussex, September 12th, 1922.

TWO GYNANDROMORPHS OF ARGYNNIS PAPHIA TAKEN IN THE NEW FOREST.—On July 18th Mr. W. S. Brocklehurst took a *paphia* with left wings male and right the typical female, and on July 24th I took one with the left wings male and the right var. *calceina*. Both were in perfect condition.—W. GIFFORD NASH: Clavering House, Bedford.

TERATOLOGICAL SPECIMEN OF CATOCALA NUPTA.—On September 3rd I took a specimen of *C. nupta* on a fence here with the left-hand under-wing of an extremely light red, merging into almost yellow in the centre, the colouring of the other wings being normal.—GEORGE C. HOLROYD; "Ganges Lodge," Oriental Road, Woking.

LABIDURA RIPARIA, PALLAS.—While spending the first two weeks of August at Bournemouth I hunted up the giant shore-earwig—*Labidura riparia*, Pallas—and was pleased to find it fairly common. Examples were to be met with under stones in the daytime, from the water's edge up to the foot of the sand cliff, and in all stages of development from nymphs $\frac{1}{2}$ in. long to full-grown adults. On the sand the young nymphs are much more difficult to see than the adults, as the markings which are dark in the adult are very faint in the young. These nymphs when exposed to the light run very swiftly away: the adults either crouch down flat on the

sand or else turn the forceps over their back in a very threatening attitude. The stones they seem to prefer to hide under are the flat ones resting upon the fine sand, and under them they often make a pit in which to rest. I generally found one under a stone, although sometimes there were two; but under a piece of lino, about 2 yards by 1 yard, that I turned over, I counted a large number of adults and nymphs. The thing that puzzled me was what they could find to feed upon; there were no plants or seaweed near where they were found, nor were there fish of any kind. The only things I found were some beetle larvæ, like wire-worms, about $\frac{1}{2}$ in. long, that live in the sand. Some earwigs that I brought home alive have eaten these larvæ very readily. They have also eaten raw beef: but they seem to like best living house-flies. These they chase and catch, using their forceps to hold their prey whilst they feed. They also use the forceps for carrying the flies about if they are disturbed while feeding. I hope to be able to keep some alive and discover at what period of the year they oviposit, and if the female is as attentive to the ova as is that of the common earwig, *Forficula auricularia*, Linn.—EDGAR E. SYMS; Wanstead, September 19th, 1922.

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology. Vol. xv, Nos. 3 and 4. Vol. xvi, Nos. 1 and 2. Liverpool: 1921 and 1922.

STUDENTS of the mosquitoes and other fly pests will find a number of papers, usually well illustrated, that will be of great interest to them, the list being too long to quote in detail. There are also in vol. xv, No. 3, a paper on Rat-flea Investigation by R. Newstead and A. M. Evans, and one on Dragonfly and other Natural Enemies of *Stegomyia calopus*, Meigen, by C. J. Young. W. J. L.

The Scottish Naturalist.

IN recent numbers entomologists will find notes on the Stinging of *Ophion luteus*, pp. 17 and 93; the conclusion of Notes on *Aphides* from Sutherland, by Dr. D. J. Jackson, nicely illustrated, pp. 85-92; and short notes and observations on pp. 27, 28, and 93.

W. J. L.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, June 7th, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.—The President announced the death of Mr. H. Rowland-Brown, M.A., formerly Secretary of the Society, and a vote of condolence was passed with his relatives. He also announced that Mr. H. Willoughby Ellis, F.Z.S., had been co-opted on the Council in the place of the late Mr. Rowland-Brown. Donations to the Library were announced, and thanks voted to the respective donors. The following were elected Fellows of the Society: Messrs. B. A. R. Gater, B.A.,

F.R.M.S., 13, Arundel Mansions, Kelvedon Road, S.W. 6; Lionel Lacey, Churchfield, Rodborough, Stroud, Gloucester; Herbert Macz, Faircotes, Harlow, Essex; William H. Jackson, 14, Woodcote Valley Road, Purley; Miss A. B. Flower, Eastbury, Surrey Road, Bournemouth West. — *Exhibits*: Prof. Poulton made some remarks on transformational deceptive resemblance in insects arising out of the exhibits of long-horned grasshoppers made by Dr. Marshall on behalf of Mr. Uvarov at the previous meeting. Prof. Poulton also exhibited an example of *Coccineila septempunctata* as the prey of an Asilid, *Laphria flava*. He called attention to some recent observations on the "false head" of Lycaenidae in relation to the attacks of enemies: he also gave numerous interesting particulars of the bionomics, geographical races and affinities of the remarkable African butterfly, *Pseudopontia paradoxa*. — Dr. Dixey, who illustrated his remarks with a lantern-slide, discussed the venation of this butterfly. He expressed the opinion that it is more closely associated to the Pierinae than any other subfamily, and that there are probably two geographical races of it distinguished by the venation. — Dr. Neave made some remarks on the habits and distribution of this species, and of *Leptosia medusa* and *Leuceronia pharis*, butterflies that are associated with it in some parts of Africa. — Mr. G. Talbot, on behalf of Mr. J. J. Joicey brought for exhibition some new and rare Lepidoptera from Africa, New Guinea, and the Dutch East Indies. The following papers were read: "Transformative Deceptive Resemblance in Long-horned Grasshoppers," by Mr. B. P. Uvarov; "Elateridae of the Seychelles Expedition," by M. Fleutiaux, communicated by Dr. H. Scott. — S. A. NEAVE, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *July 13th, 1922.* — Mr. E. J. Bunnett, F.E.S., President, in the Chair. — Major Stuart Maples, Monkswood, Huntingdon, and Messrs. H. Candler, Broad Eves, Ashstead, and E. B. Watson, Winthorpe Grange, Newark, were elected members. — Mr. R. Adkin exhibited two specimens of a dark grey form of *Grammesia trigrammica* (*trilinea*), from Abbots Wood, where the species had been unusually common at sugar. — Mr. Buckstone, living larvæ and pupæ of *Pyrameis cardui*, the ground-colour of the pupæ varying from pale grey to blackish. — Miss A. K. Loch, a uniformly pale yellow aberration of *Brenthis euphrosyne*, with quite normal spotting, from Worth, Sussex. — Mr. H. Main, several items brought by him from the South of France: (1) larvæ of the ant-lion, *Palpares libelluloides*; (2) the Tenebrionid beetle, *Pimelia gallica*; (3) cases of the large Psychid, *Acanthopsyche atra* (*opacella*), with young larvæ; (4) the spider, *Lycosa narbonensis*, discussed by Fabre; (5) the spider, *Clotho durandi*, found under stones; (6) the Myriapod, *Scutigera arencoides*, said to be poisonous; (7) larvæ of the butterfly, *Thais rumina*. — Mr. Cheeseman, living larvæ of *Attacus cynthia* and *Samia cecropia*, two large silk-spinning moths. — Mr. Enefer, the larch weevil, *Molytes germanus*, from Farningham, Kent. — H. J. TURNER, *Hon. Editor.*

THE ENTOMOLOGIST.

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NOVEMBER, 1922.

[No. 714

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 223.)

Works Published in England.

- Albin, E. Natural History of English Insects: illustrated by 100 hand-coloured plates and 100 leaves of Text (1720); priced at about 30s.
- Barrett, C. G. Lepidoptera of the British Isles; 11 vols.: 504 coloured plates (1893-1907). This work deals with the whole of the Order up to and including the Tortrices. It has some serious defects, but is indispensable to the student. The price of issue was £34 13s. It is now catalogued at £25. There was also an edition without plates brought out at £6.
- Buckler, W. Larvæ of British Butterflies and Moths: 9 vols. (1885-1899). A Ray Society publication, issued at £9 9s. Still to be obtained, I believe, from the Ray Society, at the price of issue. Copies that come into the market from time to time usually realise the same amount, or thereabouts. This is of course the standard work on the larvæ of the British species, and treats of the whole Order to the end of the Phycids. The coloured plates number 164.
- Curtis, J. Illustrations and Descriptions of the Lepidoptera found in Great Britain and Ireland: 2 vols.: 193 coloured plates (1862); issued at £9 12s. 6d. This is a reproduction of the Lepidoptera of Curtis's great work British Entomology. It can usually be picked up for from £3 to £4.
- Donovan, E. Natural History of British Insects: 16 vols.: 576 coloured plates (1792-1813). The price of this work varies from £6 to £9. There were reproductions issued in which the plates are very inferior, and the lower-priced copies probably refer to these.
- Entomologist, The. Vols. I to LIV (1840-1921). A complete set is extremely difficult to obtain, owing to the scarcity of Vol. I (1840). Dr. Chapman's copy, which included about a dozen duplicate volumes (1887-1898), fetched £12 10s. at auction.

A complete set might be worth £10 or £11, but I have not seen one catalogued recently.

Entomologist's Annual. 20 vols. (1855-1874); usually to be obtained at from 20s. to 30s. according to binding and condition.

Entomologist's Record. Vols. 1 to 32 (1890-1921). A set is usually to be bought for £6 or £7. Dr. Chapman's sold for £5.

Entomologist's Monthly Magazine. Vols. 1 to 57 (1864-1921). Dr. Chapman's copy brought £9 - probably its full value. A few years ago I required a number of volumes to complete my set. These I picked up, bound, for less than 2s. 6d. per volume.

Entomologist's Magazine. Edited by Edward Newman. 5 vols. (1832-8); quoted at £2 10s. to £3 10s.

Entomologist's Weekly Intelligencer. Edited by H. T. Stainton; 10 vols. (1856-1861). I have seen this priced as low as 18s. A clean bound copy can usually be obtained for 30s. to 40s.

Entomological Society of London. Transactions. 69 vols. (1836-1921). A set, 1836-1906, was priced at £60; another, 1836-1920, at £75. Dr. Chapman's copy sold for £21, but that of course was a dealer's bargain. The earlier volumes are out of print, and are almost impossible to obtain otherwise than as part of a set.

Harris, Moses. The Aurelian (1778) and several subsequent inferior editions: 44 coloured plates. A good copy of the original edition sells for £4 to £5, one of the inferior subsequent editions for from £1 10s. to £3.

Harris, Moses. An Exposition of English Insects (1782); with 31 coloured plates. Several editions were issued and are to be had at from 20s. to 40s. according to condition and quality of plates.

Haworth, A. H. Lepidoptera Britannica (1828), 609 pp. An extremely scarce book, the greater part of some portions of the issue being accidentally burnt: only a few complete copies are in existence. In 1919 I wanted a copy, and a careful and prolonged inquiry eventually elicited that there were two copies it was possible to purchase. For one of those £5 5s. was asked; for the other, a much inferior copy, £8. I doubt if one now could be purchased for less than £10.

Humphreys and Westwood. British Butterflies and Moths and their Transformations. 3 vols. (1841-5), and subsequent editions with much inferior plates. The first edition is usually priced at from £4 to £5. The subsequent editions are almost useless, the plates are so inferior.

Kane, W. F. de V. European Butterflies; 1 vol.: 15 uncoloured plates (1885). Admirable in every way, and absolutely essential to all collectors and students of this branch of the subject. Out of print, but can often be had second-hand for 10s. to 12s.

- Lang, H. C. The Butterflies of Europe Described and Figured ; 2 vols. ; 395 pp. ; 82 coloured plates (1884). As essential as the last ; published at £3 18s. To be purchased at from £2 10s. to £3.
- Leech, J. H. British Pyralides ; 121 pages of letterpress and 18 plates (1886) ; with coloured and uncoloured plates. The former is rare and costs from 20s. to 30s. The latter can be had for 7s. 6d.
- Lewin, W. Insects (Lepidoptera) of Great Britain ; with 46 coloured plates (1795) ; £1 to £1 10s.
- Meyrick, E. Handbook of British Lepidoptera (1895). Essential to all British lepidopterists. There are plenty of second-hand copies in the market at about 3s. 6d. per copy.
- Newman, E. Illustrated Natural History of British Moths ; 1 vol. (1869) ; and Natural History of British Butterflies ; 1 vol. (1871). These books, valued and invaluable in their day, can now be obtained for about 2s. 6d. per volume.
- Petiver, James. This author wrote a number of pamphlets on various natural history subjects in the early eighteenth century ; amongst them was one on the Rhopalocera with 5 coloured plates published in 1717. These are probably the earliest figures of British Lepidoptera. The work is scarce, and I have never seen it offered, but I know of two copies which cost their respective owners approximately £5 and £12.
- Pierce, F. N. Genitalia of the Noctuidæ of the British Islands ; 1 vol. with 32 plates (1909).
- Pierce, F. N. Genitalia of the Geometridæ of the British Islands ; with 48 plates (1914). These two volumes are indispensable to students, and can still be obtained from the author. They were issued at 7s. 6d. per volume.
- South, R. Butterflies and Moths of the British Isles ; 3 vols. (1906-08). Published at 21s. One of the most practical popular works on British Lepidoptera ever issued. Known and appreciated by all students.
- Stainton, H. T. Manual of British Butterflies and Moths ; 2 vols. (1857-9). To be purchased for a few shillings, the price depending upon binding and condition.
- Stainton, H. T. Natural History of the Tineina ; 13 vols. ; 80 coloured plates (1855-73). Text in four languages. Infinitely the best work ever published on this group. Issued at £8 ; can be obtained at present for from £3 to £3 10s.
- Stephens, J. F. Illustrations of British Insects ; 12 vols. (1828-46) ; 100 coloured plates. Was issued at £21. Can now be purchased for from £4 to £5.
- Stephens, J. F. Systematic Catalogue of British Insects (1829). Published at 27s. ; to be purchased now for about 5s.

- Tutt, J. W. British Lepidoptera : 9 vols. (1889-1914). Tutt's "*magnum opus*." It is absolutely necessary to all students. It was issued at £9, and is now to be purchased for about £1.
- Tutt, J. W. The British Noctuae and their Varieties : 4 vols. (1891-2). Published at £1 8s.; now catalogued at £1 2s. to £1 5s.
- Wheeler, The Rev. G. The Butterflies of Switzerland and the Alps of Central Europe (1900). Admirable and indispensable to all collectors and students of European Rhopalocera. Published at 5s. per copy, or 6s. interleaved. Still to be obtained, I believe, from the author.
- Wilkinson, S. J. British Tortrices : 1 vol. : 4 uncoloured plates : published at 18s., priced now at 15s. My copy, purchased in 1917, cost 7s. 6d. The price has appreciated of late years.
- Wilkes, B. English Moths and Butterflies : 120 coloured plates (1747-60) : published at £9 9s. Several subsequent and inferior editions. The present cost of the original edition is £3 to £4 according to condition and binding.
- Wood, W. Index Entomologicus (1839) : 54 coloured plates (1944 figures). An extremely useful work from several points of view, but especially because Wood figured Stephens's types of species and forms named by the latter. A copy is priced at 45s. The Westwood edition (1854) has much inferior plates, but it contains a useful supplement. It is valued at the same price as the original edition. There is another inferior edition dated 1845, which is priced at 30s.
- Zoologist, The. This magazine, between the years 1841-63, contained a large amount of entomological matter. A year or two ago I saw, too late, a copy of these volumes priced at 1s. per volume. This is the only occasion that I have noticed them catalogued.
- Zoological Record (1864-1920) : 57 vols. Published annually by the Zoological Society. Gives references of everything of any importance that is written within the year in every department of zoology. This work is, of course, essential to every advanced student. Unfortunately its bulk prevents most private libraries affording it shelf room. It is published at 30s. per volume, and is usually catalogued second-hand at from 6s. to 10s. per volume.

(To be continued.)

ERRATA.—P. 198, line 19, for 47° read 37°; p. 199, line 33, for *clots* read *dots*; p. 221, line 33, for original *plates* read original *drawings*.

HENRI FABRE AND THE MICROGASTER.

BY REV. G. W. CRUTCHLEY.

SURELY Fabre, that "incomparable observer," cannot err in his notes on the *Microgaster*, yet I am puzzled to account for what I have seen of its activities. Fabre tells us that these flies do not attack the larvæ of *Pieris brassicae*, but that they deposit their eggs in the eggs of the butterfly. He enclosed *Microgaster glomeratus* with the larvæ of *Pieris brassicae* without result. But as soon as he substituted eggs for caterpillars the flies eagerly used their ovipositors and laid their eggs inside the eggs of the butterfly. The larvæ of *Pieris brassicae* emerged from the eggs, and developed without any apparent inconvenience from the parasites which hatched out within their tissues. When the larva of *Pieris* was about to pupate the larvæ of *Microgaster* issued from one of the spiracles and formed the familiar yellow silk cocoon, in which they pass the pupa stage of their development.

Gathering the eggs of *Pieris brassicae* I kept them until the larvæ appeared, then fed them until they had moulted four times. Then I placed them on a cabbage which was growing in a convenient position for observation and visited them every day. One day I noticed a great deal of agitation amongst the caterpillars. They had left off feeding, and every five or six seconds the upper half of their bodies was jerked violently back. This action was continuous, always with the pause of five or six seconds, then simultaneously all the larvæ would throw back their heads as by a common impulse. They were gathered in groups of from six to eight, though there were a few solitary ones. I sat and watched them with the aid of a glass for over an hour and was well rewarded for my pains.

Presently I saw *Microgaster* flies coming singly and settling on the cabbage, while I noticed others climbing painfully up from the centre of the plant. As I watched a *Microgaster* fly alighted near the head of a caterpillar that was quieter than the others. She approached warily and appeared to touch and soothe the larva with her antennæ. Suddenly she sprang on the back of the caterpillar and it immediately swung its head round and apparently bit the fly, though I found out afterwards that in this I was mistaken. The *Microgaster* was tumbled down into the cabbage and afterwards I saw it climbing back slowly and with difficulty. I watched another fly very busily cleaning its antennæ, legs, wings and abdomen for a long time, and I wondered why. I also noticed a green fluid on the surface of the cabbage leaves. Single flies continued to arrive and others were still struggling out of the centre of the cabbage. The one which had been so long at its toilet flew away as though glad to be gone. Several others attacked the caterpillars, always in the same way and with the same result. It was a certain

prelude to a journey into the interior of the cabbage. Immediately the caterpillar felt the prick of the ovipositor the fly was flung off, but in one instance, probably through the weariness of the larva, the fly was in position three seconds before it was thrown off. But it was not clear what was the nature of the defence which the larvæ had against the fly.

After about three-quarters of an hour the caterpillars grew hungry and three or four of them climbed up to the edge of the leaf and began to feed ravenously. Presently a *Microgaster* appeared on the opposite side of the leaf and slowly approached. I watched through my glass and saw the mode of attack and the nature of the larva's defence. The caterpillar, conscious of danger, ceased feeding, and the fly crept up until she had reached a position with one leg on each side of the caterpillar's head and gently waved her antennæ. With a sudden spring she was on its back and instantly the heads of the four larvæ were turned towards the fly, while their movements were so rapid that I could not follow them. It was like watching a cat set on by four dogs. In about three seconds the fly was thrown off and was dragging its body and struggling along the leaf. I examined it through the glass and found it was completely drenched in green liquid, which fastened the wings to the body and stuck the legs together so that they were useless and dragged behind. The liquid was so abundant that wherever the fly went she left a trail of it behind her. Now she began the same industrious toilet which I had seen the others perform, and when cleansed seemed glad to escape and fly away.

If the *Microgaster* lays her eggs only inside the eggs of *Pieris brassicæ* what were these flies doing, and why this careful stalking and fierce persistent attacks in spite of the unsavoury green liquid with which they were drenched? The fear of the larvæ as shown by the jerking of their heads in unison and their refraining from food proves that it is a recognised danger, the knowledge of which must have come down to them through many generations.

We had a plague of *Pieris* in West Cornwall which stripped the cabbage and turnip fields, and so numerous were the larvæ that it was impossible to put the foot down without crushing them. Nature provided the only effective remedy and the *Microgaster* cocoons were everywhere. They could be found on nearly every flowering stem of thrift and plants of like character, and at Gwinnear Road Station, where there is a wall about three hundred yards long, the wall was covered with them. Selecting a space covering one square yard of the wall I counted 100 cocoons, each of which contained from fifty to two hundred chrysalids. The entire space of the wall was covered in like manner.

Porthleven,
Helston,
Cornwall.

MOSQUITO DIAGNOSIS: A SUGGESTION TO DESCRIBE WING-SPOTS, FORK-CELLS AND PALP-MARKINGS BY MEANS OF WRITTEN FORMULÆ.

By GILBERT E. BROOKE, M.A.Cantab., L.R.C.P.Edin., D.P.H.,
Chief Health Officer, S.S. Medical Dept.

IN describing a mosquito for a book or paper nearly every detail can be adequately set forth in words without the aid of diagrams or photographs. The various shapes of scales are now well recognised and need only be referred to in zoological parlance. The mosquito can be measured and its actual size given. The position, colour and size of abdominal or leg-banding can be expressed in words without ambiguity.

There are three details, however, which it has been almost impossible up to the present to express in words, and recourse to diagrammatic sketches or photographic reproduction has usually been found necessary. I refer to (*a*) anopheline wing-spots; (*b*) the relative length of the first submarginal and second posterior fork-cells in culicine wings; and (*c*) to the size and position of anopheline palpar banding. In working out diagnostic tables for the use of my department, I felt that if these details could be reduced to writing it would mean not only the saving of much expense in the reproduction of illustrations, but also greater scientific accuracy. Hence the formulæ presently to be described, which are now published in the hope that they will prove useful to entomologists.

WING-SPOTS.

For all practical diagnostic purposes, with regard to wing-spots, we are only concerned with those which occur on the costal, the subcostal and the first longitudinal veins. These may be black spots in a dominantly light wing, or white spots in a dominantly dark wing.

The wing formula is arrived at in the following way: The costa, from a basal point opposite to the axillary notch, as far as its junction with the first longitudinal vein, is arbitrarily divided into 25 equal parts. To each of these parts a letter of the alphabet (omitting "i") is assigned, beginning from the basal point. If *black* spots are being described we begin the formula with "B = so and so"; if *white* spots are being described, we begin with "W = so and so." The costal spots are described first, each spot being designated by the alphabetical letter or letters of the one or more sections which it occupies. A cæsure is used to punctuate the spots, and the conclusion of the costal part of the formula is marked by a double cæsure. The formula then proceeds with the literal designation of the spots on the subcostal vein, similarly

concluded with a double caesura. Finally the spots on the first longitudinal vein are exemplified.

It may sound a little complicated, but the absolute simplicity of it will be seen by the following diagram of the wing-spots of *maculatus*, and the formula which follows it. A long spot occupying, say, five divisions, at *l. m. n. o. p.* can be shortened by calling it *F*, which shows at once its position and length. Sometimes a spot may be only one division in length, while it actually occupies half of one scale division and half of another: such we designate by, say, $\left\langle \frac{l}{2} + \frac{u}{2} \right\rangle$. Sometimes a spot occupies a little more than one scale division: such can be shown by, say, $n +$.

The objection has been made to me that it is very hard in practice

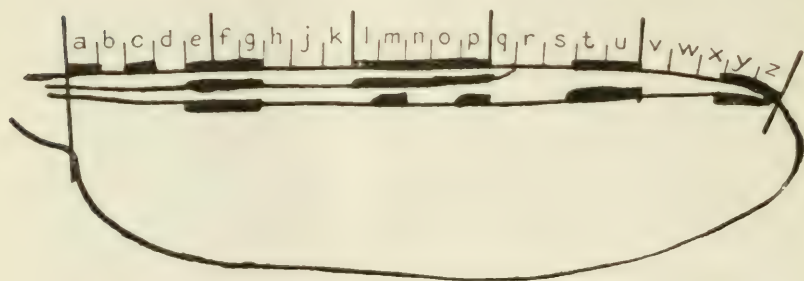


FIG. 1.—Wing of *Anopheles maculatus*.

Formula: $B = a^2 c^2 d^2 f^2 i^2 j^2 k^2 l^2 m^2 n^2 o^2 p^2 q^2 r^2 s^2 t^2 u^2 v^2 w^2 x^2 y^2 z^2$.

to divide up the costa by observation and to assign spots to the definite divisions. This is much simpler than it seems, for all that is necessary is to draw the wing and spots with a "drawing-eye-piece," and then approximate a scale to the drawing and write down the formula.

The following are the wing formulæ of some of our Malayan anophelines:

elegans $B = a^2 d^2 g^3 i^2 s^4 x^2 g^3 i^3 q^2 a^2 g^3 i^2 n^4 s^4 u^2/x^2$.

umbrosus $W = o/y/nl/y$.

barbirostris $W = q/y^2 q^2 \left\langle \frac{c}{2} \right\rangle \left\langle \frac{d}{2} \right\rangle \left\langle \frac{f}{2} \right\rangle \left\langle \frac{g}{2} \right\rangle$.

fuliginosus $W = d^2 g^2 o^2 u^2 z^2 \left\langle \frac{g^2}{2} \right\rangle \left\langle \frac{o^2}{2} \right\rangle \left\langle \frac{c^2}{2} \right\rangle \left\langle \frac{g^2}{2} \right\rangle \left\langle \frac{k}{2} \right\rangle \left\langle \frac{n}{2} \right\rangle \left\langle \frac{u^2}{2} \right\rangle \left\langle \frac{z}{2} \right\rangle$.

ludlowi $B = a^2 d^2 i^2 l^2 i^3 p^2/j^2 i^5/b^2 f^2 l/n + i^3 g^2$.

karwari $B = a^2 c^3 l^2 i^3 y^2 c^3 e^6/a^2 c^3 l^2 u^2 q^2 i^3 y^2$.

FORK-CELLS.

We frequently find such very indefinite descriptions as "the first submarginal cell is a little narrower and much longer than the

second posterior cell"; or "the base of the first submarginal cell is almost level with that of the second posterior."

I therefore suggest that a line be drawn through the angles of the two cells in question and produced to cross the costa. The basal angle which this line makes with the costa can be used as a **critical angle** for the fork-cells of each species. The size of the angle can be quite reasonably gauged by mere observation, or can be accurately measured from a *camera lucida* drawing or microphotograph.

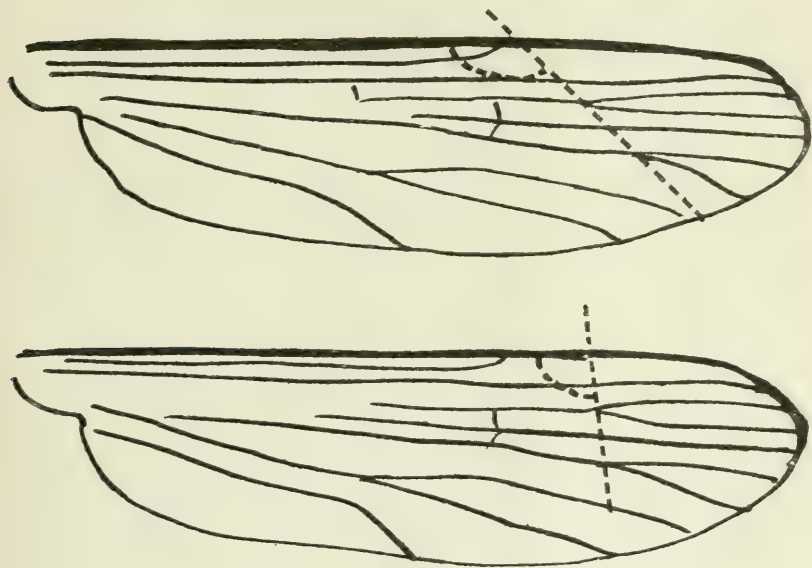


FIG. 2.—Critical angles for fork-cells.

PALPS.

The position and size of bands of anopheline palps or culicine probosces are of diagnostic importance. Diagrammatic representations are frequently misleading. I suggest therefore that a definite numerical palp formula be assigned to each anopheline.

The idea is, always to divide the palp into 24 imaginary divisions. The relative proportions of dark or light segments are expressed by a simple sequence of numbers beginning from the base of the palp, dark sections being shown by ordinary numerals and light-coloured sections by italic numerals. The number, size and position of the bands is thus seen at a glance, and palps of different species can be compared without the expense of reproduced drawings and without the indefiniteness of a written description.

The following are the **palp formulæ** for some of our Malayan anophelines :

kochii = 5 1 4 1 4 1 4 1 3.

elegans = 7 2 6 1 2 1 1 4.

*ambrosus** = 24.

barbirostris = 24.

fuliginosus = 7 1 8 1 4 3.

maculatus = 8 1 7* 3 1 4.

rossi = 8 1 7 1 3 4.

ludlowi = 9 1 8 1 2 3.

karwari = 7 2 6 2 1 3 1 2.

* A faint yellow band is often found in the middle of this dark section.

May 28th, 1921.

SOME UNDESCRIBED RHOPALOCERA IN THE BRITISH MUSEUM (NAT. HIST.) II.

BY N. D. RILEY.

LYCENIDÆ.

Pseudaletis spolia, sp. nov.

♂. *Upperside, both wings*: Black with lemon-yellow markings. *Fore wing*: The yellow markings consist of a subquadrate spot in cell slightly before the discocellulars, not extending quite across the cell, and a broad irregular subapical bar from slightly beyond middle of costa to rather below the middle of hind margin, but not reaching either by some 2 mm. *Hind wing*: On the hind wing there is a single large conical yellow patch extending from the base towards hind margin, which its apex, in area 2, very nearly reaches, but not extending towards inner margin beyond vein 2. Three silver spots marginally in areas 1b and 1c. *Underside, both wings*: Greyer, the markings of upper side repeated and rather larger, the yellow slightly paler. *Fore wing*: An indistinct, slightly paler narrow antemarginal fascia, more marked anteriorly, and another, similar, from costa between the subapical bar and the antemarginal fascia, curving outwards to join the antemarginal fascia in area 3. A short diffuse oval white patch centrally at the base of area 1b. *Hind wing*: The central yellow area much more sharply defined and reaching nearer the margin. Between it and the hind margin run two pale narrow bands, the outer curved and forming a white spot on vein 5, the inner straight. The area between vein 2 and inner margin is densely covered distally and posteriorly with bright ochraceous scales through which run two silvery bands, both black-edged, the proximal by far the longer and broader: neither quite reaches vein 1b. Internal to each of the three silver spots in areas 1b and 1c is a larger jet-black spot.

♀. *Upperside, both wings*: The lemon-yellow markings enormously

increased in extent, in the *fore wing* reducing the black markings to a narrowish band extending from base along costa and hind margin into the extremity of area 1a, its inner edge very irregular throughout, forming a broad tapering bar across the discocellulars, which fuses with a triangular patch in the base of area 2, and a broad black subapical bar enclosing an oval patch of yellow. The base of the wing as far as the origin of vein 2 is suffused with pale orange. In the *hind wing* the whole wing is lemon-yellow with the exception of a narrow black border which extends as far as the anal lobe, where it encloses the three silver spots, which are a good deal larger than in the male. *Underside, fore wing*: As above, except that there is no basal orange suffusion; the cell is filled with black to a little beyond the origin of vein 2, so that a yellow oblong spot is thus enclosed in the cell; and that the band on the hind margin is narrower than above, the difference in the corresponding widths being occupied, in the apical area only, by white. *Hind wing*: Marginal band also narrower than above, inwardly edged with white, terminating half-way along costa with a wedge-shaped black mark directed towards the extremity of vein 3, but barely reaching vein 7. A narrow irregular black mark extends from base some slight distance along vein 1b, and beyond this is a series of three rather indefinite black points in a curve, the uppermost on vein 3 at its origin, the others one each on veins 2 and 1b. The orange scaling of the male in the abdominal region is represented only distally and faintly along vein 1b: of the two silver bands of the male only the outer is present, and extends as far as vein 2.

The abdomen, thorax and palpi in both sexes orange below; in the male black like the wings above, slightly banded with yellow laterally, in the female the head and thorax above are dark brown, the abdomen conspicuously yellow banded laterally and dorsally, and the thick tuft of hairs at the extremity of the abdomen grey.

Length of fore wing, ♂, 23 mm.; ♀, 27 mm.

B.M. Type No. Rh. 194 ♂, 195 ♀. Buar. Cameroons. May, 1914.

The male agrees very well with Holland's figure of his *nigra* (Ent. News. iv. pl. 1. fig. 9) and also with his description (Annals and Mag. [6]. x. p. 286) except as to colour. All the markings here described as yellow appear to be white in *nigra*. Similarly the female would do very well for *antimachus*, Staudl., were it white instead of yellow. The probability seems to be that *antimachus nigra* and *spolia* will all prove to be forms of the same species.

Pseudaletis dardanella, sp. nov.

♀. *Upperside, both wings*: Dead white, the hind margins and cilia black. *Fore wing*: The costal area to just beyond end of cell, the base of wing as far as the origin of vein 2, and the discocellulars, all orange. The whole of the apical area black, the marginal band decidedly broad, black, the inner edge of the continuous black area thus formed very irregular and diffuse. Some slight orange suffusion is also present against the marginal border on vein 1 and centrally

in area 1a. *Hind wing*: The black marginal border commences just above vein 7, is broadest on vein 6, and from there gradually narrows to just beyond vein 2, where it again expands and encloses three largish silvery marginal spots; it is here internally bordered by a slight orange suffusion.

Underside, both wings: White. *Fore wing*: Marginal border on costa is about 5 mm. wide and rapidly tapers to a narrow line posteriorly. The costal area is uniformly black, to within about 1 mm. of the marginal border, from which it is separated by a curved tongue of the white ground-colour, and extends posteriorly in four broad projections, of which the first occupies the base of the cell and is barely separated from the second, which is directed towards the origin of vein 2, but ends bluntly about halfway across cell; the third forms a broad mark along the discocellulars, ending abruptly at the origin of vein 3, and the fourth, by far the largest, extends to the middle of area 3. The extreme base of area 2 is filled with black, and there is a trace of an orange band against the marginal border in area 1b. *Hind wing*: The marginal border very much narrower than above, reduced to a mere anteciliary line posteriorly; a largish black mark at the extremity of vein 8, slightly outwardly directed, and a black dash along the base of vein 1a. Silver marginal spots as above, inwardly surmounted by black dots, the surrounding area orange, crossed near its inner edge by a very indistinct silver band, and extending marginally as far as vein 4.

Head and thorax, above and below, orange. Abdomen banded with white and grey, anal tuft grey. Antennae dark brown.

Length of fore wing 27 mm.

B.M. Type No. Rh. 196 : Cameroons, Crowley Bequest.

Looks at first sight like *Ps. antimachus*, Staud., but can readily be separated from that species by the absence of the white apical area on the fore wing above and by the very different arrangement of the black markings of the underside of the same wing. It undoubtedly belongs to that section of the genus.

B. M. (N. H.),

S. Kensington:

March, 1922.

RECORDS FROM A SOUTH HAMPSHIRE LEPIDOPTERIST'S LOG-BOOK FOR 1920.

By A. T. POSTANS.

THE following records are taken practically entire from my original diary for the season 1920, the only omissions being names of locality and detail of a minor nature. Further, I would add that these records are a portraiture of field work accomplished in spite of the handicap of living in the centre of a large town, with the addition of a sixty-five-hour working week fifty-two weeks of the year.

The winter 1919-1920 will long be remembered as one of the mildest on record—at least by people in the south of England. Countless larvæ, etc., must have been tempted early from their hibernation. In my own small garden sallow was in bloom on January 16th, and at dusk on the same date I found larvæ of *Nania typica*, *Phlogophora meticulosa* and *Arctia caja* feeding on hollyhock and the young shoots of honeysuckle. On February 7th *Xylocampa areola* appeared in my outdoor cage and several were bred during the following days. The 8th was extremely mild and cloudy, and during the forenoon I cycled to the woods to search palings and tree-trunks for imagines of *Hybernia leucophaearia*, etc., but I saw not a single insect of any sort. During the evening of the 13th I found many larvæ of *N. typica*, and a few *T. pronuba* and *Eurois prasina* feeding in the garden. The 15th was another mild day, and during the forenoon I was in the woods to search palings, etc., and I observed about two dozen males of *H. leucophaearia* at rest, but saw nothing else. On the 29th in the same locality, although the weather was still mild and calm I only noted two male *H. leucophaearia* after much searching. Of *Phigalia pedaria* or *Apocheima hispidaria* I had not as yet seen a sign, although these two species are usually abundant here.

March 21st was an ideal spring day, being beautifully bright and warm. I went to the woods in the forenoon and saw many *Brephos parthenias* flying round sallow bloom, and odd specimens of *Vanessa io* and *G. rhamni*; a long search of tree-trunks only revealed a solitary *X. areola*. *H. leucophaearia*, etc., were now apparently quite over as I did not observe any either on this date or later. On March 22nd *Aleucis pictaria* was bred and also during the following days. They were from wild larvæ I had collected the previous summer. March 24th was somewhat cloudy after three or four bright days, and I determined to visit sallow bloom, which was fast going over owing to the exceptionally mild winter. So having observed a likely clump on the previous Sunday I visited it in the evening at dusk. There were very few insects about, however, chiefly *O. vaccinii* and *E. satellitia* and one or two each of *T. pulverulenta*, *T. miniosa*, *T. munda*, *T. incerta*, *X. areola*, etc., and I netted a couple of *E. abbreviata*. Rain commenced to fall about midnight and I arrived home somewhat damp. On the 26th I noticed a newly emerged *Pieris rapae*, drying its wings in the garden. The 28th was a mild spring day, calm in the evening, with a half moon behind a film of light cloud. I visited the sallows again, and observed all the species noted on the 24th with the addition of *T. gracilis* and *T. gothica*. That usual pest *T. stabilis* seemed quite scarce. My net gave me a couple each of *E. abbreviata* and *Lobophora carpinata*, while *E. pumilata* was flying in some numbers about gorse by the road-side. On the 30th *Anticlea nigrofasciaria* was bred.

On April 4th saw imagines of *E. albipunctata* appearing in my cages. They were from wild larvæ collected the previous autumn. On the 17th *Hydriomena ruberata* was bred. The 21st was bright and warm during the day and in the afternoon I found larvæ of *Aretia villica* and *A. caja*, commonly, in bedstraw clumps growing on a sunny bank bordering a main road outside Portsmouth. Ova of *Lycia (Biston) hirtaria* hatched on the 23rd. On the 25th I found larvæ of *Parasemia plantaginis* swarming on the downs a few miles outside the town. Quite 50 per cent. of these larvæ subsequently fell victim to a fungoid disease that invariably manifests itself after an unusually wet winter. During the afternoon of the 28th I obtained more larvæ of *A. villica* in the lanes and I saw many half-grown larvæ of *Odonestis potatoria* on the rank grass.

On May 5th *Ephyra pendularia* was bred and larvæ of *A. villica* commenced to spin up for pupation. The 12th was sunny with a rough wind from the S.W. I went to the woods in the forenoon, and beat much birch, chiefly to obtain larvæ of *G. papilionaria*, but I failed to find even one. Indeed all larvæ seemed to be remarkably scarce, and remained so throughout the spring, the oaks in particular showing none of the usual devastation by *Tortrix viridana*. Imagines of *Venilia macularia* were just making their appearance, and I saw a couple of *Vanessa io*, but observed little else. The 16th was a warm, calm, sunny day, and I cycled to some woods fifteen miles out. Much searching of beech trunks revealed solitary examples only of *Tephrosia consonaria* and *T. punctularia*, which species usually abound here. Imagines of *Hesperia malvae* and *Nisoniades tages* were evidently just coming out, as I saw a few fresh specimens of each in addition to numerous *G. rhamni* and *Vanessa io*, etc. One side of the wood comes out at the top of some downs, and here I found *Callophrys rubi* in superb condition flying and sitting in abundance over and on beech foliage. Here also were numerous *Ematurga atomaria* flying over heather, and I netted a few *Eulype hastata* and two female *S. mendica* flying in the sunshine. Beating produced *Bapta bimaculata*, *B. taminata* and *Cidaria corylata*, etc.

(To be continued.)

NOTES AND OBSERVATIONS.

NOTE ON SYNONYMY OF TWO MICRO-LEPIDOPTERA FROM BRITISH COLUMBIA.—Through the kindness of Mr. E. H. Blackmore I lately received some named species of micro-lepidoptera from British Columbia, of which two call for comment.

(1) *Depressaria blackmori* Busck is a later synonym of *D. dryadocrena*, Meyr., but the fine bred examples now sent show that the species to which these names apply is unquestionably the European *costosa* Haw. These examples, bred from *Genista*, agree exactly in

the minutest details with a series bred by myself from *Genista* at Cambridge. The occurrence of this and some other European species (as *Carcina quercana*) in British Columbia, and not in the Atlantic States, is very interesting, and must indicate immigration by way of Siberia.

(2) *Tortricodes fragariana* Busck is by no means correctly assigned to *Tortricodes*; it is in fact a *Peronea*, with veins 3 and 4 of hind wings coincident—an unusual character, but not involving exclusion from the genus. Hence the name *fragariana* cannot stand, since there is already an earlier *Peronea fragariana*, Kearfott: I propose for the species the name *elapsa* **nom. nov.**—E. MEYRICK; Thornhanger, Marlborough, October 12th, 1922.

PROBABLE DANGER OF A NEW PEST.—I lately received from Paris for determination an example of a small dark *Tortrix* which I recognised as *Laspeyresia molesta* Busck, an insect native to Japan and China, but accidentally introduced into the United States, whence it was first described. The larva bores the fruit of the peach, and is very destructive. M. Trouvelot, who communicated the specimen, stated that it was bred at Fréjus (Var), where it appeared suddenly last year for the first time, a large proportion of the crop being damaged. I am not aware that it has been found previously in Europe. It seems to me so highly probable that this obnoxious insect will be imported into this country in fruit or otherwise (since it has already crossed both the Pacific and the Atlantic) that I think fruit-growers would be well advised to look out for it, and report at once on its discovery. The larva attacks the twigs as well as the fruit, and a description of its habits by A. L. Quaintance and W. B. Wood will be found in the Journal of Agricultural Research, vol. vii, No. 8 (1916), issued by the Department of Agriculture at Washington.—E. MEYRICK; Thornhanger, Marlborough, October 12th, 1922.

COLIAS CROCEUS IN N. WALES.—On August 19th a male of this species was taken, and two others seen at Rhyl, N. Wales.—W. BOWATER; 23, Highfield Road, Edgbaston, Birmingham.

COLIAS CROCEUS AND HERSE CONVULVULI IN SURREY.—Since reporting *croceus* at Coulsdon on August 13th, I have made several additional captures in the neighbourhood up to September 3rd. The preponderance of males is rather striking, *i.e.* 13 out of 15. The size of the specimens also seems much below the average.

On September 29th I had brought to me a fine ♀ *convolvuli* which had been captured at rest on a shed door at Old Lodge Lane, Purley. Although taken the day previously it was in almost perfect condition, which seems to point to the fact that it had emerged locally.—ARTHUR BLISS; The Cottage, Red Down Road, Coulsdon, Surrey.

HERSE CONVULVULI AND COLIAS CROCEUS AT WADHURST, SUSSEX.—On October 3rd a fine female *Herse convolvuli* was brought to me; it had been found at rest in the town. I kept her for eggs but failed to obtain any. Judging by the spring immigration of *Colias croceus*, I fully expected that 1922 would be an "*edusa* year," but so far I have taken but one specimen, a female, on September 7th. Wadhurst is under twenty miles from the coast and I was out collecting on most sunny days.—A. H. JONES; Church Gate House, Wadhurst, Sussex.

HERSE CONVULVULI AND COLIAS EDUSA AT BRIGHTON. — During the week ending September 11th a dozen *H. convolvuli* (mostly females) were taken at Brighton. Two were found by lads, two in covered buildings, and eight caught in the net hovering over the flowers of scented *Nicotina* plant at dusk. A full-fed larva of this insect also was found at Chichester in August, but unfortunately died just before pupation. During August *C. edusa* appeared in the usual localities here, but only in dozens (including two var. *helice*); probably this was due to the continued rough and wet weather we have experienced ever since the females arrived from France in early June. As to the recent attempt to change the name of this insect, I am content to call it "*edusa*" as it has been known by that name for the last 150 years. Similarly, it may be, we shall soon be hearing that Wellington's great battle on June 18th, 1815, will in future be called the "Battle of Planchmoit," as it took place one hundred yards nearer to this Belgian village than to Waterloo. — F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

No attempt to change the name of *C. croceus* has been or is being made: it is merely being sought to depose the usurper *edusa* in favour of the rightful name *croceus*. The (wrongful) employment of the name *edusa*, even for 150 years, cannot surely justify the perpetuation of the error. Besides, what is 150 years after all? Are there not many more such periods to come? Is it so very difficult to put up with a little inconvenience now if by so doing we may very greatly benefit future generations of entomologists? — N. D. R.

HERSE CONVULVULI IN HANTS AND THE SCILLY ISLES. — Three specimens of this Hawk Moth have been brought me within the last six weeks, two being male and the last a female. All were in good condition. The first and third specimens were taken at rest within 100 yards of one another. I have just heard from a non-entomological friend that while staying lately in the Scilly Isles no less than ten specimens flew in, on different nights, to a conservatory. — (Rev.) J. E. TARBAT; Fareham, October 13th, 1922.

HERSE CONVULVULI AT CHICHESTER. — Several specimens of this moth have occurred here during the last week of August and the first of September. No less than four were caught on successive evenings, and brought indoors by a cat. It is somewhat singular that this moth so often falls a victim to *Felis catus* (*domesticus*); but the explanation probably is that the moth is mistaken for a bird. The first which I saw was on August 29th. — JOSEPH ANDERSON; Alre Villa, Chichester, Sussex.

HERSE CONVULVULI IN THE ISLE OF WIGHT. — On September 8th Mr. George E. Norrish caught a fine male *Herse convolvuli* resting on the heading of the side door of his shop in High Street, Ventnor. He has kindly given the moth to me. — H. H. L. SCOTT; Woodcliffe St. Lawrence, Isle of Wight.

POLYGONIA C-ALBUM, ETC., IN BUCKS. — On September 2nd I saw a specimen of *P. c-album* at Monks Risborough, Bucks, and two others have been seen in the district. I am glad to say *Agriades corydon* was present in larger numbers this year and fresh specimens

could be seen in mid-September. I took a specimen of *A. bellargus* with a blue spot on the underside, also one *semi-obsolata*, but aberrations were scarce in both *bellargus* and *corydon*. Out of a batch of 12 *C. croceus* larvæ seven produced females, of which two were of the *helice* form. I have not seen *croceus* myself during the last two months but a fair number have been seen in the district. I found about 12 *M. aurinia* in the spring, all males, but have still to find the headquarters of the insect.—WALTER PIERCE; The Bungalow, Terry Road, High Wycombe.

POLYGONIA C-ALBUM IN STAFFS AND HEODES PHLAEAS AB. SCHMIDTII.—Mr. Overton, of Fairfield Mount, Walsall, and I took a small copper, ab. *schmidtii*, in Sutton Park, Warwickshire, a day or two ago; it was a perfect specimen. Also I took *P. c-album* in a garden here (Staffs), which I think is rather unusual.—J. D. W. SHEDDEN; 69, Highgate Road, Walsall, September 26th, 1921.

STAUROPUS FAGI IN EPPING FOREST.—I was pleased to find that *Stauropus fagi* is still to be found in its old locality of Epping Forest, as this year on September 15th I beat out a small larva, and another full-grown specimen on the 18th of the same month.—A. W. MERA; 5, Park Villas, High Road, Loughton.

PERCNOPTILOTA FLUVIATA IN LANCASHIRE AND WESTMORLAND.—In all six specimens of this species have been taken locally this year. My own Westmorland dates are May 11th, June 5th and June 23rd, taken at light early in the evening (Witherslack). Mr. A. E. Wright has taken three also, at a light in one of his windows. These are Lancashire, therefore. The latest date (July 24th) seems to indicate that the species may have bred in this country this year. Newman and South consider it very rare in the north. Dr. Ellis' old Lancashire and Cheshire list mentions two specimens only for Lanes. Dr. Forsythe's Lancaster list (Ent. 1905) makes no mention of it. Mr. Wright also has a specimen that was taken at St. Anne's, Lancashire, within the last few years.—Dr. LOWTHER; Feruleigh, Grange-over-Sands.

SCARCITY OF SPILOSOMA LUBRICIPEDA.—At the conclusion of his notes on Lepidoptera in the Alton District (*antea*, p. 231), Mr. Stowell says he has seen but one single specimen of *S. lubricipeda* during the last four years, and asks whether it is getting scarce. During the same period I have not seen even one in this district and the same question has occurred to me. It used to be one of our commonest species. I should like to know if a similar experience has obtained in other parts of the country.—(Rev.) J. E. TARBAT; Fareham, Hants.

ICHNEUMONS ATTACKING COCOONS OF CERURA BIFIDA.—A few days ago when examining cocoons of *C. bifida*, pupæ of which I had reared from ova during the past summer, I was surprised to notice in several a tiny hole neatly drilled. Being curious to account for the presence of these I opened the cocoons showing them. In nearly every case I discovered the enclosed pupa to be dead and packed with the full-fed grubs of some small species of ichneumon. In one of the cocoons opened the parasite had evidently not long made its

entry, for I discovered it at rest on the apparently healthy pupa. Examination of the latter, however, under a fairly strong glass revealed the fact that the intruder had been there long enough to accomplish its purpose, for numerous ova were discovered, deposited in the spiracles, particularly those nearest the head. Disgusted as I was I could not help but admire the instinct that enabled the ichneumons to detect their hidden prey; to penetrate successfully a seemingly impassable barrier; and afterwards to deposit their ova in the most vulnerable parts of the pupa, the spiracles.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

LEPIDOPTERA AT LOWESTOFT IN AUGUST.—*Crambus alpinellus* was taken in two or three localities, notably and unexpectedly in a railway cutting about two miles inland from the sea. *C. latistrius* was there also in smaller numbers and one *Spilodes palealis*. A single *Eupoecilia degreyana* was taken amongst *Linaria*, and other insects of some interest were *Cerura boida*, *Pheosia dictaeoides*, *Eugonia erosaria*, *Drepana binaria*, *Lathosia complana*, *Crambus contaminellus* *Homoissona nimbella*, *Rhodophora adcenella*, *R. consociella*, *Dichelia grotiana*, and *Eupoecilia anthemidana*.—H. C. HAYWARD; Repton, Derby.

LEPIDOPTERA FROM THE NEIGHBOURHOOD OF OUNDLE.—Several interesting species have been taken this year in Ashton Wold. *Colias croceus*, a few. *Melitaea aurinia (artemis)*, a single example was taken in Ashton Wold, where it has not been observed for many years. *Polygonia e-album*, hibernated specimens, and an example of the summer brood were observed, and one captured. *Callophrys rubi*, a butterfly usually very rare in this district, was obtained in Ashton Wold, and in Oundle Wood. *Manduca atropos*, *Hemaris scabiosae*, *Ino statives*, *Leucania pudorina* and *Agrotis cinerea* also occurred in, or in the neighbourhood of, Ashton Wold. The larvæ of *Euchelia jacobaeae* were exceptionally abundant, feeding in some cases both on the wild and the cultivated strawberry.—MIRIAM and ELIZABETH ROTHSCHILD; Ashton Wold, Oundle.

LEPIDOPTERA IN EAST TYRONE, 1922.—*Euchloë cardamines* was about in large numbers during the fine hot weather in May and early June, and the following aberrations occurred: *marginata*, Mihi, *dispila*, Raynor, and some deeply coloured forms of ab. *ochrea*, Tutt. Most of these were found at rest on *Cardamine pratensis* in the evening. On May 27th two females were captured with the fore wings, above and below, extensively blotched and streaked with orange, the second specimen taken being also the ab. *caulosticta*, Williams. By the way, in answer to Mr. Guy Stanton's query (*antea*, p. 238), the aberration mentioned by him is ab. *quadripunctata*, Fuchs, and is fairly common hereabouts. An interesting series of *Diaphora mendica* was bred during the month: they vary from almost pure white to a pale smoke colour. Several of the white forms have dark bars across the central area of fore wings; the parent of these forms was an almost pure white female, male parent unknown. Single examples of *Pyrameis atalanta* were observed in early June, but none have put in an appearance so far this autumn, to keep *Aglais urticae* company on the scabious flowers. About the middle of June *Ino*

statices was found in some members, but mostly worn, in a new locality in this district. The summer emergence of *Pieris napi* was remarkable for the large percentage of examples with the apical blotch, discal spots and inner marginal streak united, forming an unbroken band across the fore wings; this form occurs almost every season but is seldom common. On September 23rd a fine *Pieris brassicae* female was captured of a pale yellow colour, as well as another example with the discal spots united to the apical blotch by a suffusion of black scales.—THOMAS GREER; Curglasson, Stewartstown.

NOTES ON LEPIDOPTERA FROM THE CHILTERN HILLS, ETC., 1922.
—Butterflies were probably quite as plentiful in the Chilterns during the past season as in 1921, except that no extra broods of *Pararge egeria* var. *egerides*, *Lycæna icarus*, *Zizera minima* and *Heodes phlaeas* occurred this year. Insects seemed to appear more gradually, so that it was often possible to get specimens in fine condition several weeks after emergence commenced, in spite of periods of bad weather. *Melanargia galatea* was locally abundant from second week in July until the middle of August. Of *P. egeria* var. *egerides* the first brood was out at the beginning of May, the second about June 20th, and the third August 18th. The butterfly seems to occur in nearly all beechwoods, and is plentiful in some. One or two *Melitæa aurinia* were taken or seen in June on chalk slopes. Odd captures have been recorded several times during the last few years, and it is probable that the species is established in some restricted locality among the hills. *Agriades corydon* males were first seen on July 30th, the females being well out on August 13th, whilst freshly emerged specimens of both sexes were obtainable as late as September 3rd. Very plentiful in several localities, but scarce in others where sometimes common. *Pamphila comma* was locally abundant at the beginning of September. *Pieris napi* was unusually scarce, but the summer insects were sometimes exceptionally large and heavily marked; others corresponding to the spring form sometimes turned up in July and August. *Colias croceus* was seen or heard of in several localities in late August and early September. Sallows produced all the usual moths from the middle of March until Easter, sometimes in good numbers. *Parasemia plantaginis* was not uncommon on one hill in the Chilterns during June. *Abraxas ulmata* was plentiful. I found that the early morning was the best time to take it, when it was often seen in considerable numbers resting on brambles, fully exposed to view, in the beechwoods. Later in the day it retires under the leaves. Sugar was not very productive during August and September.—S. B. HODGSON; 3, Bassett Road, N. Kensington, W., October 9th, 1922.

ABERRATIONS OF *COLIAS CROCEUS* AND *AGROTIS EXCLAMATIONIS*.
—While looking through the collection of Lepidoptera belonging to my friend, Mr. F. Wood, of Ditchling, Sussex, I noticed two of his captures for this year which I think are worth recording. The first is a male specimen of *C. croceus* which is of the *helice* form which I understood to be peculiar to the female. The other, two specimens, a male and female of *Agrotis exclamationis*, in which the usual "heart and dart" marks are entirely obliterated by a dark cloudy suffusion

covering the whole of the discal cell, and sharply bounded thereby. The *croceus* was taken on the South Downs near Ditchling, and the *exclamationis* were both captured at sugar in Mr. Wood's garden in Ditchling village.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford, S.E.

ARICIA MEDON AB. ALBIANNULATA, HARR.—On August 14th this year I was so fortunate as to capture a well-marked male specimen of this form at Dartford, Kent. It is remarkable also in that the anterior end of the marginal series of red spots on the upper side of the fore wing is conspicuously powdered with white.—C. H. HARDS; 40, Brewery Road, Plumstead, S.E. 18.

RETARDED EMERGENCE OF MESOLEUCA ALBICILLATA.—To-day, September 26th, on looking into my pupa cage I was surprised to see a newly emerged ♀ specimen of the above insect. It had only just completed the drying of its wings. The other portion of the brood, some twenty-five, had emerged normally in early June. South (Moths of the British Isles) mentions the occasional appearance of *M. albicillata* in the autumn. Possibly all such examples might be due to similar retarded emergence, and if this sort of thing happens with one species, why not with others that are perhaps regarded as partially double-brooded? —FRANK LITTLEWOOD; 22, Highgate, Kendal, September 26th, 1922.

KILLING WITH CYANIDE. — I do not think that it is known—at any rate I have never seen the fact referred to in any book or journal I have ever read—that a butterfly or moth killed in the cyanide bottle (half an hour in a strong bottle will ensure death, although no harm accrues if left in longer) and then simply pinned or laid loose in a tin box (an empty tobacco tin will do) quite *dry* and without any *relaxing* agent whatever, will, *of its own accord*, in the space of about forty-eight hours (for an insect of average size, like *Pieris rapae*) return to its original natural flexible condition. A shorter period (say twenty-four hours) will suffice for small insects, whilst an *extra* day or even two days may be necessary for the largest moths. The tin may be kept in the ordinary sitting-room temperature. The same thing happens, of course, if the specimens are left *in* the killing bottle for an equal period of time, but it is only this season that I discovered that the happy result might be obtained in the above more convenient way, without the necessity of encumbering oneself with a number of reserve killing bottles. Cyanide of potassium is one of the best all-round killing methods, almost its only drawback being the “rigor” that it causes, and which renders immediate setting impossible. The above hint may enable even a busy collector to use cyanide more freely, as it is an easy matter to put each day's killing into a separate resting-tin and to affix the date. If, when the insects *have* arrived at the proper setting condition, it is not convenient to set them, I use a laurel leaf tin, which is admirable for *keeping* them relaxed, though apparently not at all necessary for bringing them to that state in the first instance. In any case, the shorter time any specimen is exposed to cyanide or laurel, or to any other killing or relaxing agent, the less likely are its colours to be injured.—FRANK LITTLEWOOD; 22, Highgate, Kendal, August 23rd, 1922.

RECENT LITERATURE.

As was anticipated (*v. antea*, p. 167), Part 2, vol. i of the *Bulletin of the Hill Museum* was published on September 14th, and contains a number of valuable contributions to the study of the Macro-Lepidoptera. The first paper raises a point which is of considerable interest to systematists dealing with the Heterocera. It consists of four descriptions taken from the MS. compiled by Sir George Hampson, and left by him in the Natural History Museum on his retirement. This MS. is extremely voluminous, and was a continuation of the *Catalogue of the Lep. Phalanae in the British Museum*, and contains numerous descriptions of both genera and species to which Hampson had attached names, which latter he had also placed in the Collections without, however, indicating that the names were unpublished. This has led already to confusion on more than one occasion in the literature of the groups; but steps are being taken to avoid any possibility of a recurrence of the trouble. The bulk of the papers, by Messrs Joicey and Talbot, are the result of further work on the very valuable collections made by Messrs. Pratt in Buru, Ceram, New Guinea, etc., and include the description of very magnificent new *Papilio* of the *Aeacus* group, very aptly named *prattorum*, from Buru, which has the same remarkable opalescent hind wings as the Philippine species *magellanus*—a discovery on which the Hill Museum is very much to be complimented.

The part unfortunately contains no illustrations, but it is understood that these will appear in the next part. In this connection the short article (Nomenclature and Illustrations) contributed by Mr. Talbot on the subject of M. Oberthur's dictum, "Pas de bonne figure à l'appui d'une description, pas de nom valable," is of interest, and undoubtedly expresses the common-sense view of this question. To make the validity of a name dependent upon the publication of a figure of the animal named, as well as a description of it, besides putting a premium on scientific work is simply impracticable. The importance of adequate illustrations is unquestionable; but the financial aspect of the proposition renders it at present hopelessly impossible.

A short article by Mr. W. H. T. Tams on *The Pollination of Early Spring Flowers by Moths* (Journal of Botany, lx, p. 203, 1922), produces some results not perhaps generally known to entomologists. The question was as to the length of the proboscis in certain species of moths which are normally on the wing in this country when the primrose is in flower; and it was found that virtually nothing whatever was known on the subject. Measurements were made of the tongues of a number of species, and it transpired that of the four species with tongues long enough to be of importance, one, *Cucullia verbasci*, was the only species which has ever been observed to visit any primrose. Results go to substantiate Darwin's original suggestion that primroses are pollinated by nocturnal Lepidoptera.

N. D. R.

WE very much regret to hear of the death recently of Mr. Arthur Horne, of Aberdeen. A notice will appear in the next number.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

—July 27th, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. Step exhibited the insects he took on the Field Meeting at Netley Heath, July 15th, including *Strangalia armata* (Col.), *Volucella pellucens* (Dip.), etc.—Mr. R. Adkin, a short series of *Cupido minimus* with blue dusting, from Eastbourne, where it was abundant in May last, and generally large in size.—Mr. T. H. L. Grosvenor, *Zygæna anthyllidis*, *Z. transalpina* and *Z. scabiosae* sent from the Pyrenees by Mr. O. R. Goodman.—Mr. F. B. Carr, larvæ of *Nemoria viridata* from Witherslack, and of *Bapta tenerata* from Horsley.—Mr. Barnett, a series of *Brenthis euphrosyne* from South Devon, and *Ematurga atomaria*, taken as late as June 22nd.—Mr. Hy. J. Turner, the race *alexandrina* of *Melitæa aurinia* with other races for comparison. It had abundance of light yellow markings on the fore wings.—Mr. Bell, larvæ of *Cerura bifida* and *C. furcula*, and stated that the ova were laid on the under sides of the leaves and not, as the books stated, on the upper. Also he showed larvæ of *Notodonta ziczac*. All were from ova found near Hatfield in June.

August 10th, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. D. W. Seth-Smith, 34, Elsworthy Rd., was elected a member.—Mr. R. Adkin exhibited a series of *Arctia villica* reared from larvæ picked up on Eastbourne Parade. They were common this year, whereas larvæ of *A. caja* were unusually scarce.—Mr. Tonge, a bred specimen of *Maenydria salicata* from Langridge Fell.—Mr. Prideaux, aberrations of *Pumilia phleas* from Kent, and a remarkable aberration of *Mesoleuca albicillata* bred from Brasted.—Major Gillett, a unique black-banded form of *Agrotis corticea*, a very light ♂ and a dark ♀ of *A. cinerea*, and aberrations of *A. exclamatoris*, all taken in his light trap.—Mr. Bunnett, larva and imago of *Ledra aurita* (Hem.), the cicada *Centrotus cornutus*, from Boxhill, with the scarce beetle *Agrius sinuatus* and *Rhinomacer attelaboides*.—Dr. Robertson, lepidoptera taken by him at Grindelwald in July. *Pieris napi* v. *bryoniae*, *Albulina pheretes*, *Acalia immorata*, *Zygæna achilleae*, *Crambus myellus*, etc.—Mr. Hy. J. Turner, species of the South American genus *Automeris* mostly sent by his friend Mr. Lindeman, and read notes on their distribution and characteristics.—Messrs. Tonge, Ham and Carr reported the abundance of *A. villica* larvæ, the scarcity of *A. caja*, and the occurrence of *P. c-album* near and in Oxford, and fresh *C. croceus*, respectively.

August 24th, 1922.—Mr. E. Step, F.E.S., in the Chair.—Mr. Barnett exhibited series of two forms of the female of *Brenthis selene* from S. Devon.—Mr. Withycombe, the larva of *Limacodes testudo* beaten from oak at Oxshott with the Hemipteron, *Acanthosoma interstinctum*.—Mr. Sims, examples of the large earwig *Labidura riparia*, and referred to its burrowing habits. He had seen a fly carried in the forceps.—Mr. Main, the spider *Clotho durandi*, found under stones in S. France, with photographs of the structure of its snare, and read Fabre's remarks on the species.—Mr. Turner, exotic species of *Pieridae*, to show the extreme development of brilliant coloration with total, or almost total, suppression of the

white coloration on both surfaces.—Mr. Robert Adkin, pupæ of *Papilio machaon*; 3, spun up on a carrot leaf, on the glass of the food-bottle, and on a dark stick amid the food respectively, were pale yellowish green; 7, spun up on dark sticks leaning against the cage away from the food-plant, were putty-coloured with broad black stripes along the sides and wing-cases black, giving them a very dark appearance.

September 14th, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—*Exhibition of Orders other than Lepidoptera*.—Mr. R. Adkin exhibited a large female of *Sirex gigas* from Eastbourne 70 mm. in expanse.—Mr. W. J. Lucas, Orthoptera—a brown form of *Mantis religiosa* from Spain, 1911; Neuroptera—specimens of *Palpares libelluloides* from Sierra de Carboneva and Algeciras, Spain, 1911–12, *Nemoptera bipennis* from Sierra de Carboneva, *N. coa* from Corinth, and *N. sinuata* from Macedonia and Syria; Hymenoptera—two specimens of the rare *Methoca ichneumonoides* taken by himself in the New Forest, one on August 27th of this year.—Mr. H. W. Andrews, the Diptera *Dioctria oelandica*, found after many years' search near Farningham, Kent; *Catabomba pyrastri*, a ♀ var. *unicolor*, from Shoreham, Kent; *Urophora cardui*, bred from thistle galls, and its hymenopterous parasites, also from Shoreham.—Mr. Hy. J. Turner, the curious "flue-brush" beetle, *Rhina barbirostris* (*Curculionidae*) from Brazil.—Mr. F. J. Coulson, var. *infusata* of *Xylophasia monoglypha*, August 22nd, at Wimbledon Common, and a blackish speckled form of *Boarmia gemmaria* bred from ova from St. Leonard's-on-Sea, with normal forms, and var. *perfumaria* from Wandsworth.—Mr. T. H. L. Grosvenor, eggs of Raptores from North India: Pondicherry Vulture from Jamsher, White-backed Vulture, Egyptian Vulture, and White-tailed Eagle.—Mr. E. Step, living Pyrenean newts (*Molge pyrenaicus* = *asper*), sent him by Mr. Goodman, and gave notes on its structure and habits.—Mr. C. L. Withycombe, Orthoptera: *Empusa egea* and *Oedipoda germanica* from S. France, *Psophus stridulus* from the Pyrenees, and a Mantid from the Straits Settlements with short prothorax and ill-developed fore legs.—Mr. Enefer, Coleoptera, *Clerus apivorus*, *Strangalia quadrifasciata*, both on cow-parsley; *Liparus germanus* and a Longicorn, both on pine logs; and a living *Carabus auratus*, all from Mürren, Switzerland. He also showed a yellow crab-spider, a wolf-spider (*Lycosa*) and the orb-spider (*Epeira fasciata*), from Clarens, L. of Geneva, and read notes on the last-named species.—Mr. H. Main, the wolf-spider *Lycosa picta*, sent to him by Mr. Bristowe from Oxshott, and described the habits of the young.—Mr. Cheeseman, a striated *Polyommatus icarus*.—Mr. B. S. Williams, Coleoptera from Harpenden; *Panagæus bipustulatus*, *Cassida hemisphaerica*, *Stilicus subtilis*, *Megarthus denticollis*, *Antherophagus nigricornis* and *A. pallens*, with *Quedius othinensis* and *Aleochara spadicea* from moles' nests.—Mr. G. E. Frisby, Hymenoptera: *Ammophila luffii* from St. Ouen's Bay, Jersey, with *A. hirsuta* and *Bembex rostrata*; and the two British *Sapyga*, *S. 5-punctata* and the rare *S. clavicornis* from Wrotham.—Mr. Stanton, Coleoptera of economic importance: *Bruchus rufimanus* and *B. affinis*, with notes on their occurrence, habits, specific identity, etc.; *B. obtectus*, its origin and habits; *Anthonomus cinctus*, first

recorded as British in 1921, a pest of pears abroad.—Mr. Stanley Blenkarn, Coleoptera: (1) British species of *Bembidium*, (2) larger ground-beetles, (3) many species of water-beetles, (4) British *Chrysomelidae*.—Mr. Tonge, living larvæ of *Sphinx ligustri*, showing wide variation in the size and intensity of colour of the oblique stripes on the sides.—The Society, the Ashdown Collection of British *Chrysomelidae*.—The President, a specimen of the fungus *Mutinus caninus*, the lesser stinkhorn.

September 28th, 1922, Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Col. Rattray exhibited a large number of lantern-slides of birds' nests in India, and gave a lecture on the exhibit.—Mr. Edwards, the fungus *Pleurotus revolatus* from a felled poplar at Blackheath.—Mr. Sperring, specimens of the dark Lincolnshire race of *Brenthis euphrosyne*, and, on behalf of Mr. Coppeard, a dark-suffused aberration of the same species, an *Aphantopus hyperanthus* with a partial double row of eye-spots on the R. hind wing, an *Epinephele jurtina* with additional spots on the fore wings and another partially xanthic.—Capt. Crocker, aberrations of *Agriades coridon* from Royston, ab. *obsoleta*, ab. *striata*, ab. *roystonensis*, ab. *semisyngrapha* extended and approaching ab. *syngrapha*, females streaked with ♂ colour, brown-suffused females, ab. *marginalis* ♂s, ab. *caerulea*, asymmetrical specimens, etc.—Capt. N. D. Riley, for Mr. Hirst, Fabre's Banded Epeira (*Argiope bruennichi*), new to the British fauna, from Rye, Sussex, and the Gorse Red Spider *Tetranychus lintearius* from Devonshire.—Mr. B. S. Williams, species of Pentatomids from Harpenden district including *Podeps inuncta*, *Selurus bicolor*, etc.—Mr. Coulson, an abnormal cocoon of *Saturnia pavonia* in the shape of a dish, and aberrations of *Coenonympha pamphilus*.—Mr. Mera, living larvæ of *Colias croceus* (*edusa*) from ova laid by a female taken during the Field Meeting at Eastbourne, and a series of *Triphaena fimbria* bred from Epping Forest, generally dark in coloration compared with an old (1880) light specimen from Ipswich typical of the then specimens.—Mr. Enefer, *Callimorpha quadripunctaria* (*hera*) from Clarens, Switzerland, and *Erebia pronoë* from Mürren in August.—HY. J. TURNER, Hon. Editor of Proceedings.

LONDON NATURAL HISTORY SOCIETY.—October 17th, 1922, Winchester House, E.C.—Mr. E. B. Bishop, President, in the Chair.—Among the exhibits were galls of *Dryophanta folii*, *D. divisa* (with flies emerging), *D. disticha*, *Andricus fecundator*, *A. collaris*, *A. globuli*, *A. trilineatus* (with flies), *A. glandulae*, all on *Quercus pedunculata* or *Q. sessiflora*; *Andricus testaceipes* on *Q. cerris*, *Diastrophus rubi* on *Rubus* sp., *Perrisia Dittrichi* on *Silva pratensis*, *P. rosarum* on *Rosa eglanteria*, *P. acercrispans* var. *rubella* on *Acer campestre*, *Perrisia* sp. on *Solidago virgaurea*, *Lasioptera populnea* on *Populus tremula*, *Contarinia* sp. on *Silene maritima*, *Rhodites eglanteriae* on *Rosa spinosissima*, *Eriophyes galii* on *Galium tricornu*, *Eriophyes* sp. aborting flower-buds of *Rumex acetosella*, *Eriophyes padi* on *Prunus padus*, and *E. geranii* on leaves of *Geranium molle*, while the rootstock was attacked by *Tylenchus devastatrix*.—Paper read, "London Fresh-water Fishes," by Mr. P. W. Horn.—H. J. BURKILL, *Minuting Secretary*.

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[No. 715

EDITORIAL.

CAPTAIN NORMAN D. RILEY having consented to take over full editorial duties, I have great pleasure in stating that he will be the Editor of the next volume of this Journal. During his novitiate this year he has not only introduced himself to our readers, but has secured the writings of several new contributors to our pages, and in many other ways added to the utility of the Entomologist.

Feeling therefore that the Journal will be in good hands I trust that the same kindly indulgence will be extended to him as it has been my gratification to receive during the past three decades.

To my coadjutors on the Reference Committee my sincere thanks are cordially tendered for advice and assistance throughout my editorship.

RICHARD SOUTH.

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 244.)

Works Published in Germany and Austria.

Borkhausen, M. B. *Naturgeschichte der Europäischen Schmetterlinge*: 5 vols: Frankfort, 1788-94: 2 coloured plates. An important work embodying many type descriptions of European Lepidoptera. Catalogued at 10s. to 12s. (1912).

Charpentier, T. von., und Zincken, J. L. *Die Zinsler, Wickler, Schabe, und Geistchen der Wiener Gegend*: 1 vol.: 178 pp., Brunswick, 1821. This work is a description of the Micro-Lepidoptera contained in Schiffermüller's collection and an identification of them with Hübner's figures. The joint authors went through the whole collection at different dates and it is obvious the result of their work should be in the hands of every micro-lepidopterist. The book can often be obtained for about 5s. Schiffermüller's descriptions are not sufficiently full in the majority of cases to permit of identification by them alone.

Esper, E. J. C. *Schmetterlinge Europäischen*: 5 vols. and 1 vol. supplement; Erlangen, 1777-1794; 440 coloured plates.

The great value of Esper as a work of reference is that he described and figured so many types of species. His figures are fairly good and nearly always recognisable. Catalogued at from £10 to £12 10s. (1912). Recently the price has greatly increased and it is now catalogued at from £25 to £30. A second edition of this work was brought out by T. von Charpentier in 1829-39. The disadvantage of this edition is that the plates, though usually considered equal to the original edition, are not, of course, coloured by or under the supervision of Esper. This edition is usually priced a little lower than the original one.

Fischer, J. E. (von Röslerstamm). *Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde besonders der microlepidopterologie*: 100 coloured plates: Leipzig, 1838. The plates of this work are very beautiful. It was catalogued in 1912 at £4 and £5 10s.

Frey, H. *Die Lepidopteren der Schweiz*: 1 vol., 451 pp.: Leipzig, 1880. An extremely useful work dealing with both macros and micros. It should be in the hands of every student and especially those who visit Switzerland. It can usually be purchased second-hand for 5s. or 6s.

Freyer, C. F. *Beiträge zur Geschichte Europäischer Schmetterlinge*: 3 vols.: 144 coloured plates: Nuremberg, 1828-30; and *Neure Beiträge zur Schmetterlingskunde*: 7 vols.: 700 coloured plates: Augsburg, 1833-58. These works have very beautiful plates, and those of the larvae especially, of which large numbers are figured, are very useful. The former work was catalogued in 1912 at from £2 5s. to £3 and the latter at from £11 to £14.

Frölich, G. F. A. *Enumeratio Tortricum Württembergiae*: 1829: 102 pp. An extremely useful little book for students of the Tortricidæ, catalogued in 1912 at 3s.

Gerhard, B. *Monographie der Lycænen*: Hamburg, 1853: 39 coloured plates. In this monograph the plates are good. As it figures and names a number of aberrations of the European Lycenidæ it is essential to all students of that group. Catalogued in 1912 at £3 5s. and £3 15s.

Heinemann, H. *Schmetterlinge Deutschlands und der Schweiz*: 2 vols.: Brunswick, 1859-76. Essential to all microlepidopterists. Catalogued in 1912 at £3 15s. to £5 10s. The value of this book is increasing in consequence of its rarity.

Herrich-Schäffler, G. A. W. *Systematische Bearbeitung der Schmetterlinge von Europa*: 6 vols.: 636 coloured and 33 uncoloured plates: Regensburg, 1843-1856. This magnificent continuation of Hübner's "Sammlung" is one of the most important works ever issued on the subject. The plates are very beautiful and even the smallest species figured is easily

recognisable. It was catalogued in 1912 at £40 and £47 10s. and recently at £60. Dr. Chapman's copy brought at auction £42, and the last previous copy that came into the market, from the library of F. D. Godman, certainly very beautifully bound, was acquired by the writer for a considerably higher figure. Herrich Schäffer's work is much scarcer, at any rate in Britain, than that of his predecessor Hübner.

Hübner, Jacob. *Sammlung Europäischer-Schmetterlinge*: 1 vol. of text and 789 coloured plates; Augsburg, 1796–1841. The most important work ever issued on European Lepidoptera. The plates are all hand-coloured and are extremely beautiful. From the great number of types named and figured the work is indispensable to the student. It is unfortunately rare. Apparently only a small number of copies were issued. The list of subscribers in my copy, which was formerly in the library of the Rev. W. Bree, is given at 69 only, and as several of those named took four, and one six, copies the names evidently included those of booksellers as well as private individuals. I fancy we have more copies in Britain than the continentals possess, in proportion of course to our population, for I know of at least a dozen in Britain, of which more than half are in public libraries. The work is at present catalogued at from £50 to £68, the price depending upon the amount of text and number and condition of plates. Most of the copies contain the full number of plates, but the text—fortunately this is not extremely important from the student's point of view—is apt to be very fragmentary, copies with full text being extremely rare; I know of only two in Britain.

Hübner, J. *Geschichte Europäischer Schmetterlinge*; Augsburg, 1796–1841 or 1842. The most beautiful work ever devoted to the earlier stages. It is extremely scarce. The number of plates varies greatly—more so than in any other work I am acquainted with. Hagen gives 449 and probably this is about the usual number, but I have seen a copy with 500 plates; on the other hand that of Dr. Chapman, which is in my possession—formerly it belonged to Fredk. Bond—contains only 126. A copy with 447 plates was catalogued in 1912 at £37 10s.; one with the same number in 1922, £42, and one with 500, £60.

Hübner, J. *Sammlung auslesener Vogel und Schmetterlinge*: 100 coloured plates; Augsburg, 1792. An extremely quaint old book, mostly devoted to birds, as its title suggests, but each of the plates, or many of them, contain a figure of one or more lepidoptera, and as many of these are the type figures, the book is valuable. Unfortunately it is extremely rare, one of the very rarest books on the subject in fact. I believe the only copy in Britain is the one in the library of Lord Rothschild.

I have never known anyone who cared to put a value on this book, but a bookseller would possibly ask anything over £30 upon it.

Hübner, J. Verzeichniss bekannter Schmetterlinge: Augsburg, 1816-26. This volume of 431 pages marks an era in the literature, for it represents the genesis of the genera of the order, as well as Hübner's final views on many of his names. It is, of course, absolutely essential to every student. It seems scarce, being seldom catalogued, but in 1912 it was priced in a German catalogue at 4s. 6d., and in 1919 I obtained a copy from Germany at about the same figure.

Kennel, J. von. Die Palaarktischen Tortriciden: 727 pages of letterpress and 24 large coloured plates (each of which contains about 100 figures): 1908-21. The latest work on the Tortricidæ. The plates are excellent, but the nomenclature of the forms figured is extremely incorrect in many cases. The letterpress is very useful as it brings what is known of the life-histories up to date. The price at the present moment I am quoted is £6.

Ochsenheimer, F., und Treitschke, F. Die Schmetterlinge von Europa: 10 vols.: Leipzig, 1807-1834. The first four volumes were written by Ochsenheimer, the last six by Treitschke. The value of this book is about 15s. It is, of course, valued for the number of type species it describes.

Poda, N. Insecta Musei Græcensis: Widmansbad, 1761. A little volume containing a number of original descriptions. It is extremely rare. There are, I believe, only two or three copies in Britain, one of which is in the Library of the Entomological Society. It would be extremely difficult to put a value on this little book, but if a bookseller who knew his business had one he would probably ask £10 or £50, or more, for it, although a well-known firm sold one not so many years ago for five shillings!

Rebel, H. Studien über die Lepidopterenfauna der Balkländer; 3 Tiel: 3 coloured plates: Vienna, 1903-1913. A very useful fauna list of certain parts of the Balkans. The plates are extremely good. To be obtained for about 30s.

Rösel von Rosenhof, A. J. Insecten-Belustigungen: 4 vols.; with Kleeman's Beiträge, 2 vols., 6 vols. in all: 404 coloured plates: Nuremberg, 1746-93. Rösel was a miniature painter, and his work contains some of the most beautiful figures that have ever been produced. Apart from this much of its value results from subsequent authors in describing a species identifying it with Rösel's figures. There were several editions of variable value, and copies with the total number of plates are rare. The original and best edition is extremely scarce. I

only know of two in Britain : one in the Library of the Royal Society ; the other is one I picked up a few years ago at a second-hand bookseller's ; it was at one time the property of J. C. Dale, and contains his book-plate. The present price of a copy is from £5 to £12, dependent on whether it is perfect or not. I was, however, offered in 1919 a perfect copy by a Berlin bookseller for the price of £50 English money. It is needless to say I did not close with the offer.

Schiffmüller (and Denis). *Systematisches Verzeichniss der Schmetterlinge der Wiener Gegend* ; 1 vol. ; 322 pp., 3 plates ; Vienna, 1776. This work, one of the earliest after Linné, contains a large number of original descriptions : unfortunately they are so brief that many of them are unrecognisable. Fortunately what with the references Schiffmüller makes to other authors, and the references other almost or altogether contemporary authors make to his book, we are, however, certain we recognise most of the insects he describes. Copies of this book are not infrequently in the market at about 10s. each.

Scopoli, J. A. *Entomologia Carniolica* ; 1 vol., 420 pp. ; Vienna, 1763. This little book, even earlier than the last, is valuable for the same reason that it is. It can usually be purchased for about 5s.

Seitz, A. *Macrolepidoptera of the World (Palearctic Section)* ; 4 vols. ; 245 plates ; Stuttgart, 1909-1920. Purports to describe and figure all the Lepidoptera of this region. Many of the figures are good, and some of the letterpress, which is the work of several writers, is good also. The whole work is extraordinarily cheap, and as it is the only illustrated modern work dealing with the region everyone should have a copy. It is to be procured for £13.

Sorhagen, L. *Klein Schmetterlinge der Mark Brandenburg* ; 1 vol., 376 pp. ; Berlin, 1886. An extremely practical and useful work dealing principally with the earlier stages. Can be purchased for a few shillings.

Spuler, A. *Die Schmetterlinge Europas und Raupen* ; 4 vols. ; 155 coloured plates ; Stuttgart, 1901-10. A popular and very useful work. For the price the plates are very good, and no student of European Lepidoptera should be without a copy. It was catalogued in 1912 at £3 and £4 5s., and in 1922 at £3 3s. and £4 4s.

Wagner, H. (Edited by). *Lepidopterorum Catalogus* ; Berlin, 1911. An enormous work purporting to give the Bibliography of every Lepidopteron of the world. This work, the necessity for which will be obvious to everyone, is a collaboration of several well-known writers, and as is usual in such cases the

work is very unequal in quality. 26 parts which form 4 fairly bulky volumes have been issued, and I understand from the publishers, Herr Junk, of Berlin, the present price of them is £1.

There are many German magazines that have appeared during the last century and a half. Amongst the most useful are :

Berliner Entomologische Zeitschrift : Berlin. Commencing in 1857. A set, 1857-1907, was priced in 1912 at £12 10s.

Deutsche Entomologische Zeitschrift : commencing in 1881. A set, 1881-1911, was priced in 1912 at £14.

Entomologische Nachrichten : Berlin, 1875-1900. A complete set in 1912 was catalogued at £4 5s.

Iris. The publication of the Dresden Entomological Society. Commencing in 1884. A set, 1884-1911, was catalogued in 1912 at £13.

Stettiner Entomologische Zeitung : Berlin. Commencing 1840. A set, 1840-1910, was offered at £18 10s.

Weiner Entomologische Zeitung : Vienna. Commencing in 1882. A set, 1882-1908, was valued in 1912 at £7 10s.

Illiger's Magazin f. Insektenkunde : Braunschweig, 1802-7. Priced in 1912 at 22s. and 25s.

(To be continued.)

A NEW GENUS AND SPECIES OF MICRO-LEPIDOPTERA FROM NEW ZEALAND.

By E. MEYRICK, B.A., F.R.S.

Fam. PLUTELLIDÆ.

Thambotricha, gen. nov.

Head with appressed scales; ocelli posterior; tongue developed. Antennæ $\frac{3}{4}$ in ♂ slender, joints elongate, with spreading whorls of extremely long fine ciliations, basal joint moderate, rather stout, with rather small pecten. Labial palpi long, recurved, second joint thickened with scales forming a very short apical tuft beneath, terminal joint somewhat shorter than second, rather thickened with scales, pointed. Maxillary palpi very short, drooping, filiform. Posterior tibiae with series of rough projecting bristly scales above. Fore wings with 1*b* furcate, 2 from $\frac{1}{2}$, 7 to termen, 11 from middle. Hind wings $\frac{4}{5}$, elongate-trapezoidal, cilia $1\frac{1}{2}$; 2 remote, 3 and 4 approximated at base, 5-7 somewhat approximated towards base.

A remarkable form, perhaps nearest to *Dolichernis*, but very distinct.

Thambotricha vates, sp. nov.

♂ 14 mm. Head pale ochreous, side-tufts bronzy. Palpi bronzy-fuscous. Antennal ciliations 8. Thorax purple-bronzy-ochreous.

Abdomen whitish-ochreous. Fore wings elongate, narrowed towards base, costa sinuate, apex pointed, termen faintly sinuate, oblique; pale yellow overlaid with purple-bronzy-ochreous, costal edge pale yellow from $\frac{2}{5}$ to $\frac{4}{5}$; discal stigmata remote, rather dark fuscous, an additional dot beneath and rather before second, these two partially surrounded with pale yellowish; a slender terminal streak of purple-fuscous suffusion; cilia whitish-yellowish, on costa suffused purple-ochreous, darkest above apex, on dorsum pale ochreous tinged purple, cilia extending to before middle of dorsum. Hind wings and cilia ochreous-whitish.

Wellington, in March, one specimen swept from forest growth by a young collector, Edward C. Clarke, aged 14, and kindly forwarded by Mr. Hudson. It is permissible to hope that the discoverer of this very interesting species may be thus early inaugurating a distinguished entomological career.

Thornhanger,
Marlborough;
October 31st, 1922.

RECORDS FROM A SOUTH HAMPSHIRE LEPIDOPTERIST'S LOG-BOOK FOR 1920.

By A. T. POSTANS.

(Continued from p. 254.)

The 20th was calm and cloudy with a south-west breeze during the day. At sunset I went to the downs and sugared posts. *Grammesia trigrammica* and *Mamestra dentina* came in abundance, and I took one female *M. genistae*, but there was little else. My net gave me one or two *Phibalapteryx vitalbata* and a male *Agrotis cinerea*, whilst *Amoeba viridaria* was flying commonly and in superb condition. The 23rd was a beautifully calm, sunny day, and the warmest of the year as yet. I spent the day in the woods, and saw numerous *C. rubi*, in fresh condition, disporting over short herbage in company with *Euclidia glyphica*, *E. mi*, *Aricia medon*, etc., also several *P. cardui* and *V. io*. Beating produced *E. hastata*, *Epione advenaria*, etc., but this method of collecting was not so productive as it sometimes is. Larva-beating likewise was not very encouraging; however, I obtained a few small *Z. betulæ* from sloe, and small larvæ of *Cucullia verbasci* were common on mullein. The 24th was another bright day, and being a bank holiday I went to the woods in another locality to look over the imagines of *Brenthis euphrosyne* for varieties, but, although typical specimens were numerous, I saw none worth taking. I netted a few *Nemeobius lucina*, a solitary *Hemaris fusiformis*, and *Lithosiæ sororcula*, but nothing else. I do not remember observing a single specimen of *C. rubi* all day in this locality.

The evening of the 25th was calm and slightly cloudy, wind S.W., and moon in second quarter. At sunset I went to the downs and sugared posts. *G. trigrammica* came in profusion, but *M. dentina* was much less in evidence than on the 20th, and I saw numerous *Apamea basilinea* and three *Agrotis cinerea*, in addition to one that I discovered newly emerged and drying its wings at the base of one of my sugared posts. I netted *Cidaria truncata*, *P. vitalbata* and *E. pumilata*, but very little seemed to be flying. In the evening of the 27th I went again to the downs, but as they were enshrouded in mist I abandoned the original intention of sugaring and confined my attention to campion bloom in the lanes; but the weather conditions seemed to be unfavourable, and very few insects were flying, so I only obtained a couple of *E. venosata* and *D. carpophaga* and odd *D. cucubali*, *E. haworthiata*, *E. vulgata*, etc. On the 28th ova of *E. atomaria* hatched from a female taken on the 16th, and *N. typica* was bred.

June 1st was calm and clear in the evening after a cloudy, warm day, wind S.W., full moon rising. At sunset I went to the downs and sugared posts as before. Some nice banded vars. of *G. trigrammica* were taken and the type was in profusion, but getting worn. The only other species seen were a couple of *M. dentina*, one *H. alusta*, also a few *A. basilinea*, and I netted *Noctua c-nigrum*, *D. cucubali*, *Acidalia marginipunctata*, etc., and *E. venosata* in abundance over campion at sunset. The 2nd was warm and sunny, and in the afternoon I went to the woods on a last venture for vars. of *B. euphrosyne*, but I saw none worth taking, and the type was practically over as they were much worn. *B. selene* was just appearing and I saw numerous beautifully fresh specimens, but all typical, so did not take any. Larvæ of *L. siliqua* I noted in abundance on honeysuckle, frequently half-a-dozen on one vine. Ova of *N. lucina* deposited on May 24th hatched this day. The evening of the 3rd was warm and calm after a southerly breeze during the day, so at dusk I visited campion bloom in the lanes. I found *E. venosata* flying commonly, but they were now much worn; also I netted a couple of fresh *D. cucubali* and *D. carpophaga* in addition to *Neuria reticulata*. I found *H. sordida*, *A. puta*, *G. trigrammica*, etc., rather commonly at honeydew on nettles. Imagines of *A. villica* commenced to appear in my cages on the 6th. At sunset on the 7th I visited campion bloom again and saw practically all the species noted on the 3rd, *H. sordida* in profusion. Larvæ of *Ortholitha cervinaria* were common on mallow and were of all sizes, some quite tiny while others were almost full fed. The evening of the 10th was beautifully clear with a rather strong breeze from the south-west. I went to the lanes at dusk, but I only saw a few of the most common species flying round the campion. No *N. reticulata*, which I went for chiefly. I boxed a solitary specimen of the delicate *Acidalia subsericeata* from a

grass-stem. On the 12th ova of *E. hastata* hatched and I successfully reared 80 per cent. of the larvæ on birch in large glass-topped boxes, and eventually these all pupated. The forenoon of the 13th was cool and somewhat cloudy after twenty-four hours' steady rain. However, the weather showed signs of improving, so I went to the woods for the day, it being Sunday. I found *Z. trifolii* out in numbers, but they were somewhat worn although I managed to secure a few good confluent forms. The only other insects observed were a few *P. plantaginis* and *A. medon*. Half-grown larvæ of *C. verbasici* occurred on almost every plant of mullein noticed. By beating sloe bushes growing by the roadside on my way home I obtained larvæ of *A. pictaria*, and from sallow a few small *Notodonta ziczac*, *N. palpina*, *S. libatrix*, etc., but no *P. retusa*, as I was rather late for this species, they having probably gone down for pupation.

The 14th was very bright all day with a south-westerly breeze which dropped to calm in the evening. The conditions seemed favourable for night work, so at sunset I went to the downs and sugared posts, and when I had finished this preliminary occupation I rigged the net and went to see what was going at the campion bloom. There were many moths flying round it, but they were very much on the alert, and I had great difficulty in approaching near enough to see what species were represented. *H. sordida* seemed to be the commonest, with *M. dentina* a good second, and I had the good fortune to get a few *N. reticulata*. I have always found this species difficult to capture, as on the slightest alarm it dives at once into the campion bed, and emerges somewhere round the edge where least expected and is off like a flash. *A. subsericeata* was now well out and I boxed several from the grass stems, and netted *X. galiata*, *X. rivata*, etc., on my way to look at the sugar patches. I found moths swarming on them and they dropped off in numbers when I turned the light on them. The commonest seemed to be *A. corticea*, *T. pronuba* and *A. exclamationis*, and I took a beautiful variety of the latter in which the orbicular and reniform marks are united to form an irregular rayed blotch over the centre area of the fore wings. In addition I took five *X. sublustris*, numerous *X. hepatica*, some richly suffused with reddish purple, and I observed several fresh *L. pallens*, the first of the season. Countless larvæ of *Hipparchia semele* and *Epinephele jurtina* were feeding on short grass by the roadside. On the 15th imagines of *Sphinx ligustri* commenced to appear in my cages. They were reared from ova from a female that I captured on the sand dunes last summer.

(To be continued.)

LIGHT TRAP EXPERIMENTS IN CONNECTION WITH TEMPERATURE, ETC.

BY MAJOR FREDERICK GILLETT.

IN Whitaker's Almanac will be found the amount of light and darkness each night given in the form of a rectangle divided into four equal squares, each square representing one quarter (3 hours) of the period from 6 p.m. to 6 a.m., the shaded squares being darkness, when there is no light from the sun or moon. These data have been accepted in the following tables. The temperatures which I give are the shade temperatures at 8 a.m. The trap has been run from 10 p.m. to 3 a.m. (summer time when that is used), the electric light being cut off automatically by an alarm clock, but I did not begin to run it consecutively till the beginning of May, since which date, however, I ran it regardless of weather whenever I was at home. The numbers of moths are given regardless of species, although it is curious that on certain nights a particular class of moths may be attracted. For instance, one night there may be several species of Prominents, whereas the next night there may be none, but instead, perhaps, Poplar and Eyed Hawks.

A dark, warm, thundery night with a drizzle of rain will nearly always bring a large number of moths to the trap, although one is quite as likely to obtain something good when very few captures are made. My impression is that a dark night is better than one with a bright moon, but at the same time I do not consider it an invariable rule. Temperature does not appear to have much effect, except when it drops very low. Males come to light far more freely than females: at the same time a very fair sprinkling of females will be found amongst the captures, and I have even had batches of eggs laid in the trap during the night.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
April 9th	36	Nil	Light all night.
„ 29th	44	6	Dark 9 p.m. to 6 a.m.
„ 30th	42	6	„ 12 a.m. to 3 a.m.
May 2nd	44°	4	„ „ „
„ 4th	46	4	„ „ „
„ 5th	44	1	Light all night.
„ 6th	47°	1	„ „
„ 7th	50°	1	„ „
„ 8th	60	5	„ „
„ 9th	60°	2	„ „
„ 10th	50°	4	„ „
„ 11th	44	Nil	„ „
„ 14th	49°	1	Dark 9 p.m. to 12 a.m.
„ 15th	50°	2	„ „
„ 20th	56°	4	„ 9 p.m. to 3 a.m.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
May 21st	61°	10	Dark 9 p.m. to 3 a.m.
" 22nd	71°	17	" " "
" 23rd	71°	15	" " "
" 24th	71°	16	" " "
" 25th	66	21	" " "
" 27th	61°	20	" " "
" 28th	58°	16	" " "
" 29th	62°	17	" " "
" 30th	64°	52	" 12 a.m. to 3 a.m.
" 31st	68°	58	" " "

It will be noted this month that on the 8th there was a considerable rise in temperature; the captures, however, did not increase to any extent with it, in fact they were less than at the end of April—possibly the darkness then accounting for it. On the 22nd there was again a considerable increase in temperature with a small increase in captures. On the 30th there was a jump in the number of captures, without any great increase in temperature, but a lengthening in the hours of darkness. In this month the darkness appears to have had more effect than the temperature.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
June 1st	66°	73	Dark 12 a.m. to 3 a.m.
" 2nd	69°	57	" " "
" 3rd	62°	127	" " "
" 4th	55°	84	Light all night.
" 5th	58°	67	" "
" 6th	61°	54	" "
" 7th	64°	50	" "
" 9th	58°	69	" "
" 10th	59°	139	" "
" 11th	60°	258	" "
" 12th	60°	112	" "
" 13th	62°	145	Dark 9 p.m. to 12 a.m.
" 14th	50°	125	" " "
" 17th	56°	630	" " "
" 18th	56°	149	" " "
" 19th	64°	397	" " "
" 20th	58°	286	" 9 p.m. to 3 a.m.
" 21st	62°	247	" " "
" 22nd	59°	133	" " "
" 23rd	59°	162	" " "
" 24th	59°	190	" " "
" 25th	55°	129	" " "
" 26th	55°	81	" " "
" 27th	58°	168	" " "
" 28th	59°	155	" " "
" 29th	54°	164	" 12 a.m. to 3 a.m.
" 30th	55°	43	" " "

On the 17th of this month there was an extraordinary number of captures for no apparent reason. On the 30th there was a great decrease in captures, also without any satisfactory reason. Whether the lack of honey dew this month had anything to do with the captures I can't say, but it may be a factor in the case.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
July 1st	56°	57	Dark 12 a.m. to 3 a.m.
.. 2nd	58	60	" " "
.. 3rd	56	113	" " "
.. 11th	56	40	Light all night.
.. 13th	57	48	" " "
.. 14th	57°	43	" " "
.. 15th	52°	89	Dark 9 p.m. to 12 a.m.
.. 16th	57	51	" " "
.. 17th	57°	22	" " "
.. 18th	52	106	" " "
.. 19th	56°	44	" " "
.. 20th	58°	88	" " "
.. 21st	61°	62	" 9 p.m. to 3 a.m.
.. 22nd	64°	100	" " "
.. 23rd	59°	88	" " "
.. 24th	54°	108	" " "
.. 25th	56	73	" " "
.. 26th	60	118	" " "
.. 27th	60	45	" " "
.. 28th	58°	96	" " "
.. 29th	59°	70	" " "
.. 30th	63°	80	" 12 a.m. to 3 a.m.
.. 31st	56°	46	" " "

The three nights, 11th, 13th, 14th, when it was light all night, produced a poor record of captures compared with the rest of the month, otherwise there was no particular feature to which to draw attention.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
Aug. 1st	54°	43	Dark 12 a.m. to 3 a.m.
.. 2nd	57°	23	" " "
.. 3rd	56	27	" " "
.. 4th	56°	30	Light all night.
.. 5th	58	24	" " "
.. 6th	60°	14	" " "
.. 7th	59°	30	" " "
.. 8th	58°	17	" " "
.. 9th	55°	8	" " "
.. 10th	54°	31	" " "
.. 11th	53°	8	" " "
.. 12th	54°	22	Dark 6 p.m. to 9 p.m.
.. 16th	54°	13	" 6 p.m. to 12 a.m.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
Aug. 17th	59°	11	Dark 6 p.m. to 12 a.m.
.. 18th	54°	7	 " " "
.. 19th	55°	45	 " to 3 a.m.
.. 20th	60°	96	 " "
.. 21st	59°	18	 " "
.. 29th	60°	32	.. 12 a.m. to 6 a.m.
.. 30th	58°	26	 " "
.. 31st	54°	9	 " "
Sept. 1st	50°	3	 " "
.. 2nd	51°	3	.. 3 a.m. to 6 a.m.
.. 3rd	51°	4	 " "

One asks oneself what was the cause of the increase in the captures on 19th and 20th; the temperature gives no clue, the amount of darkness increased, but it was the same on the 21st when the numbers fell.

From these tables it appears that the hours of darkness have some effect, the temperature during the summer months at any rate little or none.

Cheriton House,
Sevenoaks,
Kent.

NOTES AND OBSERVATIONS.

EUCHLOË CARDAMINES AT CHICHESTER IN SEPTEMBER.—Mr. Guy Stanton, of Dunston College, Rochester, Staffs, writes to me as follows: "It may interest you to know that while staying at Chichester for several days I noticed two specimens of *Euchloë cardamines* on September 13th, and succeeded in taking one, a male, near Boxgrove Priory."—JOSEPH ANDERSON; Chichester.

COLIAS CROCEUS AB. FAILLÉ AND HERSE CONVOLVULI IN LINCOLNSHIRE.—On September 3rd on the railway bank not far from my house I took a specimen in excellent condition of *Colias croceus* ab. *faillae* Stef. I see the late Mr. Rowland Brown refers to this aberration as follows: "Often occurs near Florence and is no doubt widely distributed elsewhere." It would be interesting to learn whether any other captures have been made this year in England. On the day previous to this my neighbour brought me a large moth that he had found at rest in his garden frame: on examination it proved to be *Herse convolvuli* in good condition.—G. T. PIGOTT (Major); Somerby, Barnetby, Lincolnshire.

COLIAS CROCEUS AT PLYMOUTH.—*Colias croceus* was plentiful at the end of August near Plymouth. I saw quite thirty one morning in the limestone quarries at Pomphlett, and was fortunate enough to note two var. *helice*, one of which I took. I also captured a female

intermediate* in shade between the var. and the normal.—C. W. BRACKEN, B.A., F.E.S.; Corporation Grammar School, Plymouth.

HERSE CONVULVULI AT BEDFORD.—Two specimens of this species were taken in September in the County Hospital but were badly damaged by the captors.—W. GIFFORD NASH; Clavering House, De Parys Avenue, Bedford.

DAPHNIS NERII OFF SCOTLAND.—A good specimen of *D. nerii* has just come into my possession. It was taken on a trawl-boat off Buchan Ness, Aberdeenshire, in September, 1917. There was a large pin through it, but I have managed to extract this and reset the specimen.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

ACHERONTIA ATROPOS AT SEA.—MR. W. T. Gilboy, of 99, Coldharbour Lane, Camberwell, writes that—"Whilst outward bound to Montreal, about 1000 miles from land, I captured a fine specimen of the Death's Head Hawk Moth."—N. D. R.

AN UNUSUAL VARIETY OF CHEROCAMPA ELPENOR.—I recently had the opportunity of examining a somewhat unusual variety of *Ch. elpenor* bred by Mr. C. H. Hards from a larva of the green form, taken in August, 1910, at E. Farleigh, Kent. It is remarkable in that the areas usually green are chocolate-coloured, the normal pink areas are pale dirty brown, and the basal and hind marginal areas of the hind wing are a darker dirty brown. Unfortunately, owing to neglect during the war, the specimen is in rather poor condition. Two apparently similar specimens are recorded by Tutt in his British Lepidoptera.—N. D. R.

ABERRATIONS OF AGROTIS CORTICEA.—An extraordinary aberration of *A. corticea* was obtained in my moth trap on June 23rd last. It is a male in perfect condition. The antennae and hind wings are normal. The centre of the fore wings is black without any markings, and on either side of this area the colouring is grey peppered with darker lines and marks. In a very strong light and at a certain angle it is just possible to make out the normal markings. I also obtained two other specimens leading up to this particular form. The first, a male, is a typical male except that the general colouring is darker. In the second, a female, the colouring is darker still, and although the markings can easily be distinguished, they have become somewhat blurred instead of standing out as they do in typical specimens owing to the lighter background.—FREDERICK GILLET (Major); Cheriton House, Sevenoaks, Kent.

MELANIC EUPITHECIA TRISIGNARIA.—I bred this year a single specimen of this species which is as pure black as *E. albipunctata* var. *angelicata*, and without markings except for the discoidal spot, which, as in *angelicata*, is of a more intense black. I am not aware that a pure melanic specimen of this species has hitherto been reported. One or two other specimens bred at the same time were darker than usual, but these are merely dark ordinary specimens and

* ♀ f. *helicina* Ob.

show all the usual markings.—H. C. HAYWARD, F.E.S.; Repton, October 18th, 1922.

SCARCITY OF *SPILOSOMA LUBRICIPEDA* AND *S. MENTHASTRI*.—I am much interested in the notes of Mr. Stowell and the Rev. J. E. Tarbot (Entom., pp. 231 and 257) on the growing scarcity of *Spilosoma lubricipeda*, because I had got a notion that the phenomenon was probably only occurring in the north of England. In my early collecting days, sixty or more years ago, *S. lubricipeda* abounded here in every garden and on every piece of waste land where docks grew luxuriantly, so much so that its larvæ were often a destructive pest. It gradually became scarcer, and is now practically non-existent. I do not remember to have seen a single larva for more than twenty years, and during that time not more than three moths in any one season, often two or one, sometimes none. This year I have seen one example only. Nor am I at all sure that the few specimens seen were bred here, as they have usually occurred on the road-sides just outside the town, probably attracted by the gas or electric lights, and may easily have been brought here on railway waggons. I never see one in my own or other people's gardens. *S. menthastri* used to be almost as abundant on the field sides, but it, too, has almost disappeared, though more recently than *lubricipeda*. Odd moths are still occasionally to be seen on the country walls, or a larva now and then crossing the road, seeking a place in which to spin up, but I have not seen even one of either this year.—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, November 3rd, 1922.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*, ETC.—I have worked "light" consistently during the past three seasons and found this insect quite scarce during 1920 and 1921, first appearing on June 20th, 1920, and May 24th, 1921. During 1922, however, it was quite common, appearing on May 30th (nine days after *S. menthastri*) and being about half as common as *menthastri*. *Agrotis nigra*, which was common at sugar in 1921, never appeared at all in 1922. *Lobophora carpinata*—always less common here than *L. polycommata*—failed to turn up this year. *Ligdia adustata* was unusually abundant from May 18th, being quite a pest.—Dr. R. LOWTHER; Fernleigh, Grange-over-Sands, N. Lancs, November 15th, 1922.

SPILOSOMA LUBRICIPEDA AND SEASONAL NOTES.—With regard to the scarcity of this species, I have not seen it at all in this district this year and only took one specimen last year. Larvæ are very late in pupating this season. I have a half-grown larva of *Smerinthus populi* still feeding, and the last of some birch-feeding Geometer larvæ obtained by beating in early October only went down on November 9th.—G. V. BULL, M.B.; Montagu House, Hoddesdon, Herts.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*.—I took two of these insects in 1919 and have not seen one since. It used to be very common here.—FRED F. WOOD; Eastons, Ditchling, Sussex.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*.—I took a small batch of newly hatched larvæ of this species this last summer on red currant

bushes in my garden here. I have always found *lubricipeda* by far the most common of the ermine moths in Notts and Lincolnshire where I have collected this last fifteen years.—A. R. F. P. WYNN; Upton, Southwell, Notts.

ZYGENIDE ATTRACTED BY *LASIOCAMPA QUERCUS* ♀, ETC.—During a recent holiday on the South Devon coast I had the pleasure of taking *Colias croceus* var. *helice*, *Herse convolvuli*, *Leucania vitellina* and *L. unipuncta* on September 1st, 2nd, 4th and 6th respectively, the two last at sugar in spite of an exceedingly bad spell of sugaring. *L. unipuncta* was apparently newly emerged. Of greater interest, almost, was the finding on a sugar-patch of a female *Noctua c-nigrum* in cop. with *N. xanthographa*. No ova were obtained, however. Assembling for *Lasiocampa quercus* produced some curious results. The female was besieged whenever I put her down by swarms of *Zygacna filipendulæ*, which would remain in the box until removed. This happened over a very wide area, and she seemed more attractive to the *Zygacnidae* than to her own species, as only a few of these turned up. —G. P. SURROX; 60, Oval Road, Erdington, Birmingham, October 26th, 1922.

CANNIBALISM AMONG *CUCULLIA VERBASCI*.—*Cucullia verbasci* larvæ are common on the Salisbury Downs, and I have often collected them. I have observed that when several are kept in a larva cage together their numbers invariably diminish even when a plentiful supply of food is at hand. Although I have never seen larvæ attack one another, I have little doubt that they are cannibals.—A. STEVEN CORBET; Reading.

KILLING WITH CYANIDE.—Respecting Mr. Frank Littlewood's note in November number, p. 260, on the use of cyanide for the purpose of relaxation, I may point out the fact that certain species, especially *G. rhamani* and both *C. edusa* and *C. hyale*, are very liable to become blotched with crimson and otherwise discoloured, and if left for any considerable time in the cyanide bottle only a small proportion of their original colour will remain.—F. W. FROHAWK.

DESTRUCTION OF *PAPILIO MACHAON* LARVÆ BY CUCKOOS.—It is generally supposed that brightly coloured larvæ are immune from the attacks of birds owing to such ornamentation acting as a protective colouring, and as a rule certain species possessing the so-called warning colours are undoubtedly distasteful to birds—for instance, I know of no bird which feeds on the larva of *Pieris brassicae*, which, although not brilliantly coloured, is nevertheless a conspicuous object. I have often watched several species of birds such as garden warblers, willow warblers, wrens, robins, hedge-sparrows and blue tits, all busily engaged in searching beds of cabbages for the larvæ of *P. rapae*, which they manage readily to detect although their colouring harmonises perfectly with the colour of the leaves, and greedily devouring them, but I have never seen any bird attempt to eat the larva of *P. brassicae*, which are passed unnoticed by all birds, although they are among the most conspicuous larvæ in their manner of living fully exposed on both surfaces of the leaves. Whether *brassicae* larvæ are eaten by the

cuckoo I have failed to determine; certainly those of which I have examined the stomachs have contained no trace of these larvæ. Unfortunately the handsome and richly ornamented larva of *Papilio machaon* is a favourite diet of the cuckoo (although it might be considered distasteful owing to its brilliant colouring, and the forked retractile tubercles emitting a strong acrid scent which are protruded when the larva is irritated) according to the facts stated by the late Mr. Fergus M. Ogilvie, who was one of the most skilled and accurate of field naturalists. I therefore think it may be of general interest to other entomologists to quote the following observations made in Norfolk and recorded by him. I omit the precise locality for obvious reasons. Mr. Ogilvie states—"One young cuckoo, obtained July 27th, contained a considerable number of the larvæ of the swallow-tailed butterfly. . . . Cuckoos are exceeding plentiful here. They are distributed in greater numbers over the Broad district than in any other locality with which I am acquainted. . . . I have little doubt that the cuckoo of the Broad lays a heavy toll on the swallow-tailed larvæ when they are in season. It may well be that the progressive diminution of this—our handsomest British butterfly—is in some measure due to the quantity of cuckoos in the district and their insatiable appetites."

It might be argued that as both the cuckoo and *machaon* have been in existence for ages, these butterflies would in course of time have long since ceased to exist where cuckoos abounded, but when we know that birds sometimes gradually acquire a liking for a new diet, which naturally becomes an inherited habit, such may possibly be the cause for the now prevailing fondness of cuckoos for *machaon* larvæ, and if such is the case this fine insect may finally disappear from its British haunts.—F. W. FROHAWK.

HENRI FABRE AND THE MICROGASTER.—With regard to the Rev. G. W. Crutchley's article under the above title in last month's Entomologist, I know the account of the oviposition of *Apanteles glomeratus* by Fabre quite well, and years ago, when his book was first translated into English, had intended writing a note on the subject. I fear the celebrated Frenchman was sadly astray in this case and *may* have confused some egg-parasite (a Chalcid or a Proctotrupid) with the Braconid. On more than one occasion I have witnessed the imaginæ of *A. glomeratus* ovipositing on larvæ of *Pieris brassicae*, and the process is as described by Mr. Crutchley. The sudden and repeated attacks and the jerk given by the host to dislodge the parasite I can confirm. I must admit, however, that I have never noticed the attackers to be drenched by the green fluid which exudes from the mouths of the caterpillars; indeed Mr. Crutchley appears to prove that if this fluid is deliberately squirted at the parasite, which I am rather inclined to doubt, it is far from being a satisfactory method of defence.—G. T. LYLE; Briarfield, Shilden, nr. Halifax.

AN UNCOMMON ANT.—Very little literature appears to exist concerning the life-history and habits of *Stenamma westwoodi* Steph. This small ant—a member of the sub-family Myrmicinae—is chiefly described as being taken in small numbers in the nests of other ants,

and, indeed, was considered by many earlier writers to occur only in such situations. However, it seems that such occurrences must be entirely accidental, as it has been my good fortune to discover a locality in North London in which nests of this ant are by no means rare. A damp wooded spot with a clay subsoil covered in moss seems to provide ideal conditions. The colonies are usually situated at the foot of a tree, preferably a few inches from the trunk, on the western side. There is no external indication of the nest, which consists merely of a small hollow, never more than an inch below the surface in summer. This cavity has only one small aperture, through which ants engaged in foraging are able to gain the surface of the soil, where, however, they take every advantage of cover provided by dead leaves, etc., rarely appearing in the open and never straying far from the nest. The colonies are never very populous, about 200 workers being the maximum number that I have found. Some forty workers and one dealated female constitutes a typical colony, but in July last I found one nest containing no less than six dealated females and only seventeen workers. The winged forms do not appear until the end of August and remain in the nests until quite late in the year. I still have both sexes in my observation nests (November 1st). The food apparently consists entirely of small insects and other animal matter. I cannot induce them to touch honey or other sweet materials. Eggs and larvæ are present all the year round. The larvæ particularly are interesting. The body is much more globular than is usual in ant larvæ, and the head is mounted on a somewhat lengthy neck—in fact the whole thing is very like a retort in shape. When a dead insect—for example, a Culicid—is brought in, it is cut up and the pieces piled among the larvæ, which proceed to devour them, their mobile necks giving them a considerable range of movement. The only Myrmecophile that I have found in the nests is *Cyphodectrus albinus* Nicolet, belonging to the Collembola.—WM. E. H. HODSON; Harley Lodge, Enfield, November 1st, 1922.

BUTTERFLIES ATTRACTED TO HUMAN PERSPIRATION.—The names of the butterflies referred to in my note on the above (*ante*, p. 212) can now be supplied. They are—*Lycaenidae*: *Lycaenesthes ligures* Hew., *Hypolycaena antifaunus* Dbl. & Hew., *Catochrysops malathana* Bois. *Acræinæ*: *Acræa peniclos* Ward., subsp. *pelasgus* Gr. Sm.—N. C. E. MILLAR; 90, Alleyn Road, Dulwich, S.E.

RECENT LITERATURE.

The Genitalia of the Tortricidæ. By F. N. PIERCE and The Rev. J. W. METCALFE. Pp. 101. 34 plates.

The joint authors of this very valuable work are to be congratulated on the successful completion of their task of working out the genitalia of this important division of the Lepidoptera.

The volume is of course another instalment of Mr. Pierce's gigantic life-work on the genitalia of the whole of the British Lepidoptera.

The author has had it in preparation for many years, and we gather that it would have been issued in 1917 but for the Great War.

The whole of the slides and letterpress are the work of Mr. Pierce; the plates, very excellent ones, are from the drawings of Mr. Metcalfe.

In previous volumes the genitalia were drawn to scale, but in the case of the Tortricidæ this process would have so reduced the figures of the smaller species their value would have been greatly lost; the drawings have therefore in this instance been kept of a fairly uniform size, so that the different and characteristic points in even the smallest species might be shown.

In the arrangements of the drawings on the plates the male organs are on the right, those of the female on the left. This will no doubt be apparent to most students, but in each future volume it might be better to give a short explanation as to the precise meaning of the various figures.

The author has gone a step further than in previous volumes, and has introduced a scheme of classification based upon the characters of the genitalia only.

This method is interesting, because it shows the relations of the various species to each other from the point of view of these organs; but it produces some strange bedfellows, and widely separates species that have in the past considered themselves nearly related, and that will in all probability continue to be regarded as such in the future. The author, however, admits that the final classification must be based upon a study of all the characters—a view with which we certainly agree.

Mr. Pierce states that the most arresting result of his study of the genitalia of the Tortricidæ is the way the species fall into clearly defined groups, and that it is possible at once to place a species in the group to which it belongs; but that these organs shed very little light on the historic relationship of the groups. He considers that with respect to position there is a connecting link with the *Geometridæ* where the characteristic hinged and much curved penis of the *Tortricidæ* appears in the *Chesiadiniæ*, notably in the case of *Anaitis plagiata* and in *Odezia atrata*. When we come to specific differences, these, although constant, are sometimes extremely small, yet within a group it is possible to secure a perfectly natural sequence.

In classifying in accordance with the characteristics of the genitalia, the author has worked out the genera with the aid of Fernald's *Genera of the Tortricidæ and their Types*; he does not, however, create new names for genera or types in instances in which he has been unable to trace any generic name, but has left blank spaces, in order to avoid creating superfluous names for genera which may already exist; he is to be thanked and congratulated on this decision.

Mr. Pierce states that in the course of the investigations of Mr. Metcalfe and himself they have added six new species to the British List, though we think there is a doubt if all of these will permanently stand. On the other hand he cannot find any difference in the genitalia between no less than five pairs of species at present, generally regarded as distinct, and with good reason in the majority

of cases. In a few species the genitalia appear to be in a plastic condition, and considerable variations are found, such as in the case of *Epiblema pflugiana*, which is apparently divided into several distinct forms, but the genitalia give no constant character by which to separate them.

On looking through the lists of species certain points strike us. We should have liked to see more synonymy in some cases. On p. 10, for instance, *Cnephasia incertana* Tr. appears without its perhaps better-known synonym, *C. subjectana* Gn.; on p. 11 *C. longana* Haw. is similarly treated, without reference to its other name, *C. ictericana* Haw. There are several other instances in which we should have been glad to have the old, better-known names indicated.

On p. xxi of the introduction we are told that the author cannot distinguish between the genitalia of *Argyroplote carbonana* and *A. nigricostana*, but on p. 46 we see *A. carbonana* Dbl.=*ustulana* Haw.=*fuligana* Barrett, and on p. 47 that it is the *A. fuligana* of Hubner of which the synonym is *carbonana* Barrett, which has genitalia not distinguishable from *A. nigricostana* Haw.

The book is one all students of the Order, and all philosophic entomologists, should possess: and we trust for the sake of the author who has produced it in these very expensive times, for pure love of science, that everyone who can possibly afford the cost will take a copy. It is to be obtained from Mr. F. N. Pierce, The Old Rectory, Warnington, Northants: and the price to subscribers, including postage, is 15s. 6d. per copy. W. G. S.

In Bulletin, No. 1 (Technical Section) of the Sultanic Agricultural Society, Cairo, pp. 12, 13. (1922), Mr. F. C. Willcocks gives a table of results of some moth-trap experiments using different coloured lights. Assuming all the lamps to have been used an equal number of times, the numbers of moths caught were: at blue light, 335; white, 297; green, 67; orange, 38; red, 37. In view of recent discussions in this magazine it is interesting to note that blue light was more attractive than white. The experiments were in connection with economic work, and a fuller report is promised later. N. D. R.

SEITZ, *Macrolepidoptera of the World*, publication of which was interrupted to some extent by the war, appears now to be on a sound footing again. The Palaearctic Division is complete and the Rhopalocera volumes at least of the other Division are going on well. In the German edition the Hesperidae have been reached in the American, the Lycaenidae in the Indo-Australian and African sections. With the moths matters are unfortunately not so advanced, but progress is certainly being made. The English edition naturally lags behind the German to some extent, but is gradually overtaking the arrears. Herren Seitz and Kernen are to be congratulated on the success which is attending their determined efforts to overcome the many difficulties with which violently altered circumstances have surrounded their undertaking. At the present rate another year or two should see the welcome conclusion of this very valuable work. N. D. R.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF HAMPSHIRE.—**A Hampshire County List of Lepidoptera** is in course of preparation. It is hoped that all entomologists who can help will do so by sending lists, especially of the Microlepidoptera, to Mr. W. FASSNIDGE, 47, Tennyson Road, Southampton.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 4th, 1922.*—Mr. Robert Adkin, Vice-President, in the Chair.—*Obituary*:—The deaths of the following Fellows were announced and a vote of condolence with their relatives was passed: Dr. David Sharp, F.R.S., one of the special Life Fellows of the Society; Mr. Hamilton H. Druce; Mr. Arthur Horne; Mr. Frank M. Littler; and Mr. G. O. Sloper.—*The Collection of Portraits*: The Treasurer made a statement as to four new portraits that had recently been hung in the Meeting Room, and a portrait of the late Dr. Sharp, presented by Mr. W. J. Lucas, for addition to the collection, was gratefully accepted.—*Election of Fellows*:—The following were elected Fellows of the Society: Messrs. Guy Babault, 10, Rue Camille-Perier, Chaton, Seine-et-Oise, France; Albert E. Waight, Brunleigh, Kent Bank Road, Grange-over-Sands. *Exhibits*: Mr. W. G. Sheldon exhibited some moths from the Farn Collection, including the rare type form of *Sarrothripus recayana* Scop., as well as ab. *ramosana* Hb., and ab. *degenerana* Hb., also *Acrobasis tumidana* Schiff., and *A. zelleri* Rag.—Professor Poulton, F.R.S., exhibited and made remarks on a living example of *Polygonia c-album*.—Mr. Arthur Dicksee exhibited some rare butterflies from Ecuador.—Dr. F. A. Dixey, F.R.S., commented on some recent observations he had made on the scent of butterflies, chiefly Pierines.—Mr. H. Donisthorpe exhibited specimens of *Aulonium ruficornis* Ol., and *Hypophloeus fraxini* Kug. two beetles new to the British list taken in the Forest of Dean.

October 18th, 1922.—Professor E. B. Poulton, D.Sc., M.A., F.R.S., etc., Vice-President, in the Chair.—*Election of Fellows*: The following were elected Fellows of the Society: Messrs. S. Stuart Light, Redcot, Linton Road, Hastings; G. H. E. Hopkins, Downing College, Cambridge; V. G. L. van Someren, C.M.Z.S., etc., Nairobi, Kenya Colony.—*Exhibitions*: Mr. Donisthorpe exhibited a series of both sexes of *Leptura rubra* taken in Norfolk.—Dr. K. Jordan, F.R.S., exhibited some Notodontid Moths the males of which have a remarkable organ on the side of the abdomen. The function of this seems to be to transmit scent from the abdomen to the hairy hind tibia and hind wing.—Professor E. B. Poulton read a communication from Dr. R. C. L. Perkins, F.R.S., on seasonal changes in the colours of the female of *A. bellargus*, and exhibited specimens of males of *Papilio dardanus* from Kibwezi, Kenya Colony, in which the colouring of the hind wing was of the western pattern. He also exhibited a living and healthy larva of *Abraxas grossulariata*, the only survivor of a fifth inbred generation that had been sleeved out on *Prunus pissardii* as long ago as the 21st July, 1921.—*Papers*:—The following papers were read: On Schmit-Goebel's Types of Carabidæ, by Mr. H. E.

Andrewes; On the Larva and Pupa of *Sabatinea*, by R. J. Tillyard; On Endomychid Coleoptera, by Mr. G. J. Arrow; On the Biology of some British Neuroptera, by Mr. C. L. Withycombe; On the Rhopalocera of the 1921 Mt. Everest Expedition, by Mr. N. D. Riley.

November 1st, 1922. — Professor E. B. Poulton, D.Sc., M.A., F.R.S., etc., Vice-President, in the Chair. — *Election of Fellows*: The following were elected Fellows of the Society: Messrs. A. N. Burns, Salisbury Road, Rose Bay, Sydney, New South Wales; R. T. Daubeney, B.A., Herne Vicarage, Herne, Kent; C. C. Ghosh, B.A., Agricultural College, Mandalay, Burma; L. G. Higgins, M.A., F.R.C.S., Heather-side, Woking, Surrey; J. F. Marshall, M.A., Seacourt, Hayling Island; A. E. Moore, Brookside, Brent Mead Avenue, Golders Green, N.W.; A. Musgrave, Australian Museum, Sydney, New South Wales; Miss E. K. Pearce, Kempston, Bournemouth West; Messrs. E. Piazza, 1734, 48th Street, San Diego, California, U.S.A.; J. Price, 165, Corporation Street, Stafford; the Rev. W. H. Richardson, 32, Wanderers' Avenue, Wolverhampton; Messrs. A. H. Ruston, Aylesbury House, Chatteris, Cambs; F. E. Wilson, Jacana, Darling Road, East Malvern, Melbourne; and H. E. Winsor, 2, Mead Road, Cranleigh, Surrey. — *Gift to the Society*: The Treasurer announced that he had received £500 towards the Housing Fund from the Misses Chapman on behalf of their brother, the late Dr. T. A. Chapman, F.R.S. — *Exhibitions*: Dr. F. A. Dixey, F.R.S. exhibited specimens and drawings of the genitalia and scent-scales of *Belenois gutta*, Godt., with those of some other species of *Belenois* for comparison. — Dr. K. Jordan, F.R.S. described the tympanal organ of *Speridodonta*, and discussed the development of this organ in the Noctuidæ. — Dr. Eltringham gave some account of similar organs in Geometrids. — Dr. E. A. Cockayne exhibited an example of Homocosis in *Ctenonannia pumilius* L. — Mr. J. E. Collin exhibited an intersex of *Myiaca duplicata*. Professor E. B. Poulton, F.R.S., exhibited on behalf of Mr. E. N. Willmer living larvæ of a Nemopterid from the Egyptian desert, and Mr. E. E. Green and Dr. Inms described the habits of a similar species from India and Ceylon. — S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY. — October 12th, 1922. — Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair. — Mr. Stanley Edwards exhibited the fungus *Clavaria crispula*, from Blackheath. — Mr. Hy. J. Turner, a photograph, by Mr. Step, of *Clavaria pistillaris*, a rare fungus found on Rammore Common and Norbury Park. — Mr. Withycombe, a queen hornet, *Vespa crabro*, caught when flying over a tramcar at Walthamstow. — Mr. H. Main, recently hatched young of the slug, *Arion ater*, the larvæ of the glow-worm *Lampyrus lusitanica*, a wolf spider, found under stones, closely allied to Fabre's *Lycosa narbonensis*, and a black scorpion abundant at Pont du Gard. — Mr. Step, a small snake, *Tropidomorphus viverrinus*, from the Pont du Gard, sent him by Mr. Main. — Mr. Blenkarn, the Coleopteron *Magdalis carbonaria* from Mickleham, not hitherto taken south of Sherwood Forest, and *Rhynchites pubescens*, which was not uncommon at Westerham in June. — Mr. L. W. Newman, a painting of an aberration of *Agriades coridon* ♂ from

Royston, with various streaks of ♀ coloration, and an extremely pale *Epinephela jurtina* from the Chilterns.—Lantern-slides were shown by Mr. H. Main, of the economy of the scorpion, of *Microdon* sp. (Dip.) a scavenger in ants' nests, and of the early stages of *Cetonia aurata*; by Mr. Dods, of a series of plants; by Mr. Lucas, of points in the life-history of *Raphidia notata*, *R. maculicollis*, *Chrysopa perla* and *Heimerobius*; and by Mr. Bunnnett, the development of the fungi *Mutinus caninus* and *Phallus impudicus*, the fungus *Geaster* sp., and ova and young larvæ of the woodlouse, *Porcellio scaber*.

October 26th, 1922.—The President in the Chair.—Mr. F. T. Vallins, 372, Sherrard Rd., E. 12, was elected a member.—Mr. R. Adkin exhibited his series of *Diaphora mendica* with its various local races, etc. Messrs. O. R. and A. de B. Goodman, both sexes of *Pieris rapae* and *P. manni* for comparison, *P. napi* of the extreme summer form *napiacae*, approaching *P. manni* in facies, and a *P. napi* with a spot near the apex strongly formed.—Miss Alice Lock, *Herse convolvuli* and a ♀ *Colias croceus (edusa)* intermediate to *v. helice*, both from Sidmouth in September.—Mr. A. A. W. Buckstone, a large sample of 500 *Pyrameis cardui* bred from Oxshott parents, pointing out specimens (1) with pale blotch in centre of fore wing, (2) with blue centres to spots on hind wings, (3) with pink nervure running through the white blotch, etc.—Mr. Blair, the ant *Myrmecophila acervorum* from S. France.—Mr. Main, flour infested with the beetle *Tribolium ferrugineum*.—Mr. Mera, a series of *D. mendica*, including a dwarf smoky female.—Mr. Enefer, the roots of the bean, pointing out the nodules which are concerned in the formation of nitrogenous compounds, which enrich the soil for the growth of crops.—Mr. Tonge, his series of *D. mendica*.—Mr. R. Adkin read a paper, *Diaphara mendica* and its varieties. A short discussion took place.—Hy. J. TURNER, *Hon. Editor of Proceedings*.

LONDON NATURAL HISTORY SOCIETY.—November 7th, 1922.—Mr. E. B. Bishop, President, in the Chair.—Among the entomological exhibits were specimens of *Hyloicus pinastri* and a living larva of *Colias croceus* (Dr. Cockayne), a collection of butterflies from Java (Mr. Collenette), examples of the second brood of *Lycaena argiolus* showing darker coloration (Mr. A. W. Mera), *Brenthis euphrosyne* selected from a number taken last May showing variation, and a pallid variety of *Hippocrita jacobaeae* (Mr. H. B. Williams), *Dicycla oo* (Mr. Worsley Wood), a case of Swiss butterflies (Mr. C. B. Smith), and galls of *Andricus Malpighii* on *Quercus pedunculata* (Mr. Ross), *Callirhytis glandium* on *Quercus cerris* and *Adelges piceae* on *Abies*, sp. Paper read—A Pilgrimage in Provence, by Mr. H. Main, illustrated by his own splendid slides and living specimens of some of the creatures described.—H. J. BURKILL, *Minuting Secretary*.

OBITUARY.

ARTHUR HORNE.

As announced last month, Arthur Horne has passed away. He had been for some time suffering from a very grave illness, and although several operations afforded temporary relief, the inevitable end came on September 25th last.

The subject of this notice was the son of the late Mr. Arthur Horne, of Longside, Aberdeenshire, where he was born on October 16th, 1861; he was thus in the fifty-eighth year of his age at the date of death. An excellent business man, he rose from small beginnings to a position of affluence. He was the founder and principal partner of "Hornes Limited," one of the chief commercial houses in Aberdeen.

Ever since his boyhood Mr. Horne has been one of the best known of Scotch Lepidopterists, and although he contributed little to the literature of the science, he was an excellent practical Lepidopterist and field worker, and undoubtedly knew more of the Highland species than anyone now living. He was also well known as an ornithologist and horticulturist. Mr. Horne was a familiar figure at the sales of British Lepidoptera held at Stevens's Rooms from time to time, but, although he would not grudge paying £15 or £20 for a choice aberration, his judgment and sense were excellent; he was not one of those men who *must* have a coveted specimen no matter what the price might run to! Although he had been seriously ill for many months, almost to the end he continued to take a keen interest in his loved science. He was elected a Fellow of the Entomological Society in 1897.

A typical Aberdonian, Mr. Horne was shrewd to a degree, a man of his word, absolutely upright in all his actions, good natured, full of humour, and with much personal magnetism; he was liked and respected by all he came into contact with, and his early decease is deeply to be regretted. He was one of the, also too few, Lepidopterists who appreciated and possessed a fine library, practically every book that could assist his studies being included in it. His collection of British Lepidoptera, one of the very finest in the country, it is understood will be disposed of, the library being bequeathed to his son Eustace, who shows marked signs of a desire to follow in his father's steps as an Entomologist. We trust he will carry on.

Mr. Horne was twice married, and leaves a widow and several children, to whom we desire to express our deep sympathy in the heavy loss they have sustained.

W. G. S.

WE very much regret to have to record the death of Mr. G. ORBY SLOPER on September 22nd last.

Also with very great regret we record the death of Mr. H. J. ELWES on Sunday, November 26th, at Colesborne, Gloucestershire.

THE

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WITH THE ASSISTANCE OF

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VOLUME THE FIFTY-SIXTH.

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HOMOEOSIS IN *COENONYMPHA PAMPHILUS*, L.

BY DR. E. A. COCKAYNE.

THE specimen, a female, was taken by Mr. F. J. Coulson at Walton Heath on July 3rd, 1922. On the underside of the right hind wing is a large area with the colour, pattern and scaling of the homologous part of the underside of the right fore wing. The affected wing is fully expanded but slightly reduced in size, and the neuration and the upperside are normal.

The figure shows the distribution of the abnormal portions, a tawny streak wider than the nervure running along 1b and a large patch occupying part of the discoidal cell spreading outwards to fill the whole of cell 2 except a narrow strip along the termen, the inner third of cell 3 and the inner three-quarters of cell 4. The inner part of the grey margin in cell 2 consists of fore wing scaling and pattern.

The most interesting part is in cell 4. Here there is a hind-wing ocellus joined by a strip of hind-wing scales to the grey border, and surrounded for the inner two-thirds of its circumference by a pale tawny ring like that of a fore-wing ocellus. Then comes a darker tawny area which shades off into a light semicircle, and next is a sharply defined much darker semicircle fading internally into the general tawny ground-colour. This last represents the dark stripe which runs quite straight in the fore wing at right angles to the anterior border.

Thus the fore-wing pattern in this abnormal wing behaves as if the hind-wing ocellus of cell 4 were the fore-wing ocellus of cell 5. In one of the four other recorded examples of this kind of homoeosis in *pamphilus*, Mr. A. W. Mera's, the distribution of the abnormal part is very similar, but in the anterior part of cell 4 there is an oval black ocellus with a white pupil. This probably represents the posterior part of the big fore-wing ocellus of cell 5. In *Epinephele tithonus* there is a double black ocellus filling cells 4 and 5 and each part has a white centre. In neither of these examples does the pattern of cell 4 correspond exactly with that of the same cell in the fore wing.

Homoeosis in connection with the wings of Lepidoptera falls into five groups :

In the first group a leg or legs may be replaced by a wing or wings. In the second the patagia may be replaced by a pair of prothoracic wings. In the third group a hind wing is replaced by a wing almost identical in shape, neurulation and pattern with a fore wing or *vice versa*. This is found in *Zygaena*. In the fourth the abnormal wing is intermediate in shape and neurulation, and in the fifth the shape and the neurulation, with one exception, are unaltered, and the abnormality is confined to the colour and pattern of part of one surface of a wing. The last is the commonest, but all are rare. I could collect only forty-two examples of the last three groups in my paper in the London Naturalist, 1921, where references to the literature can be found.

Schmit-Jensen found that after amputation of part of the



A homoeotic female of *Coenonympha pamphilus*. Fore-wing markings reproduced on hind wing. $\times 1\frac{1}{2}$ approx.

antenna of the stick insect, *Carausius morosus*, it was sometimes regenerated in the form of a tarsus, and the late Dr. Chapman repeated the experiment with the same result. The case of a Dipteron, *Dilophus tibialis* Loew., with an antenna branching from the right fore coxa is probably an example of injury followed by the usual reduplication, but the extra appendage is homologous with instead of being the same as that from which it springs.

This suggests that some form of injury, not necessarily a gross physical one, may be the cause in Lepidoptera. It receives some support from the fact that the abnormal wing is often a little smaller or incompletely expanded. Even this does not explain why a damaged part may be replaced by a structure homologous with it, rather than by one identical with it.

Since I wrote the above note Mr. H. A. Leeds has very kindly lent me two more specimens of *C. pamphilus* showing the same condition. The first, which he took in Kent on July 18th, 1922, is a male with numerous little streaks and spots of the tawny colour

of the underside of the fore wing on the underside of the right hind wing. There are two small spots between 1a and 1b, several streaks in the outer half of the cell between 1b and 2, a large patch at the inner end of cell 2, and streaks and dots in the outer part of the same cell; in cell 3 there are two patches, the outer of which is edged externally with dark scales, like the margin of the same part of the fore wing, and in cell 4 is a very small spot. There are three patches in the outer part of the discoidal cell, the largest being continuous with that in cell 2. The second, also a male, was taken at Monk's Wood, Hunts, on the 8th of August, 1922. This has a large patch of the dark colour of the base of the underside of the hind wing on the underside of the right fore wing. It occupies the inner four-fifths of cell 1 and extends forwards to fill most of the inner half of cell 2. There is also a small spot in the extreme postero-internal part of cell 3, corresponding almost exactly with the dark spot found in the same situation in the hind wing. In cell 2 there is also a patch about 1 mm. square near the margin.

The whole of the abnormal part has scales exactly like those of the hind wing, and like the hind wing is covered with short hairs. Neither specimen shows any abnormality in shape, size or neurulation and their upper sides are unaltered.

The following are additional records of homoeosis: *Agriades bellargus*, Entomologist, 1922, lv, p. 257; *Plebeius argus* L., Barrett, British Lepidoptera, vol. i, p. 72, both with upperside colour on the underside. *Papilio horishanus*, with a small area of the colour of the underside of the hind wing on the underside of the fore wing, shown by Mr. Dicksee at the Entomological Society of London in November, 1922. *Cidaria prunata*, male, with a streak of the colour of the upper side of the right hind wing on the upperside of the right fore wing. This was taken at Malvern in 1904 by the Rev. A. Day.

RECORDS FROM A SOUTH HAMPSHIRE LEPIDOPTERIST'S LOG-BOOK FOR 1920.

By A. T. POSTANS.

(Concluded from Vol. LV, p. 273.)

The 17th was cloudy all day, wind south. The atmosphere became very close and oppressive in the evening so at sunset I went to the downs again and sugared my usual posts. Moths came later in the greatest profusion, literally covering the patches. They were not so light-shy, and allowed me to take

toll of them with the utmost unconcern. I noted all the species seen on the 14th with *X. sublustris* now in profusion and I took a solitary *N. reticulata*. Moths were also common at campion bloom at dusk but nothing like the numbers on the sugar, and a solitary *D. conspersa* was the only new addition. I got more *A. subsericeata* from grass stems and netted *X. galiata*, but little else. The same weather conditions prevailed on the 21st and moths again swarmed on the sugar. Two *M. suasa* were the only new additions and I took a solitary *A. cinerea* still in good condition. From campion bloom I took one each of *N. reticulata* and *H. umbra* but the bloom now was fast going over, and consequently losing its attraction. The 23rd was bright and warm during the day with slight wind from the south-west, calm in the evening. At dusk I went to the sand hills on the coast and sugared the marram grass. *Agrotis ripae* came in plenty but the males were already worn. However, I managed to get a fine series. Also two or three *M. suasa*, and a solitary fine *H. abjecta*, the first of the season. From privet blossom at dusk I netted numerous *M. albicollis*, and solitary *A. emutaria*, *C. porcellus*, etc. *Leucania littoralis* were just emerging and I saw many at rest on the marram stems, newly emerged, drying their wings. On the 24th larvæ of *A. pictaria* commenced to go down for pupation, and ova of *Pararge egeria* from a female taken on the 13th commenced to hatch. On the 29th ova of *X. rivata* hatched; these were deposited on the 17th.

The weather about this time seemed to break up and rain fell almost daily so that there was very little chance of collecting. However, during the evening of the 30th slightly better conditions prevailed, although fast-moving black clouds were coming up from the west, giving promise of more bad weather very soon. At dusk I went to the downs to try sugar, but very little was attracted—chiefly *A. exclamatoris*, *X. monoglypha*, *X. sublustris*, *X. hepatica*, etc.—and I was surprised to see a beautifully fresh *H. abjecta* so high up on the downs. It had probably blown up from the marshes, which are quite two miles away. I netted a few *L. lithargyria* from bramble blossom in addition to a female *C. porcellus* which I kept for ova. The next morning I placed her in a flower-pot with some *Galium verum* and she lived for five days, depositing a few ova each evening—total in all, just ninety. From short grass I picked up a female *G. venaria* which I also kept for ova. I observed many fresh *Hypena proboscidalis* flying in the shelter of bushes, and on long grass countless cocoons of what I thought were *Zygaena filipendulæ*. I collected a number in the hope of obtaining vars. later. Quite 90 per cent. of these pupæ produced the hybrid *hippocrepidis* (*antea*, liii, p. 212), and the others varying forms of true *filipendulæ*, some with orange flushed hind wings and others with enlarged, sometimes confluent spots on the fore wings.

The forenoon of July 4th was overcast, but as there were signs of improvement later I went to the woods for the day to look over *A. cydippe* and *D. paphia* for vars., but all I saw were typical so did not take any. The usual rags of *L. sibylla* were floating over the bramble blossom in company with fresh *A. hyperanthus*, *E. jurtina*, etc. Much searching of oak trunks revealed one *Boarmia crepuscularia* and one *N. nebulosa*. Larvæ of *N. lucina* in the cages were now pupating. The 9th was fine during the day and cloudy during the evening after a week of dull wet days. At dusk I went to some rough ground near the coast and sugared ragwort, posts, thistles, etc., but only numerous specimens of *X. monoglypha*, *T. pronuba*, etc., were attracted, and I netted a couple each of *Hecatera serena* and *Leucania conigera* from bugloss blossom but saw very little else. Larvæ of *E. atomaria* reared on knotgrass and the foliage of vegetable pea from the garden had by now all pupated in my cages. The 12th was cloudy in the evening and later developed fine rain, which, however, soon cleared away. Wind in the south-west. I went to the downs at dusk and sugared posts. Only a few insects were attracted, chiefly *X. monoglypha* and a few *X. sublustris*, also a couple of *H. derasa* and a solitary *H. abjecta*. From bugloss blossom I netted a *C. porcellus*, but as it was much worn I released it. I noticed many larvæ of *E. jurtina* still feeding on grass by the roadside on my way home.

The 14th was bright all day, but it clouded over in the evening and the south-westerly breeze dropped to calm. At dusk I visited a salt marsh near the sea and smeared my sugar on rushes, and later I secured eleven fine *H. abjecta*, a solitary *L. favicolor*, and saw numerous common species such as *M. oleracea*, *L. pallens*, etc. At dusk I netted *Acidalia remutaria*. The 15th was another fine day, which clouded over again in the evening, so I went again to the salt marsh and obtained more *abjecta*—about two dozen. One I found newly emerged on a reed stem drying its wings. In addition I took a fine red form of *L. pallens* and a couple of the second brood of *M. suasa*, as they were rather small but very fresh. Ova of *B. crepuscularia* hatched on the 16th.

The forenoon of the 18th was calm and sunny, so I went to the woods. I saw very few insects flying—chiefly worn *A. cydippe* and *L. sibylla*, etc.—and I netted a solitary female of *Eucosmia undulata*, which species seems to be quite rare about here, as this is the first specimen I have taken for several years. The evening of the 19th was clear and calm, with a very heavy dew about midnight; moon in first quarter. At dusk I sugared in the salt marsh, and later took about a dozen *M. abjecta*, and saw several much worn. Two of those taken were of an unusually light brown, lighter than any I have seen before. The second brood of *M. suasa* was now common. At dusk I netted a couple

of *A. remutaria* and some *C. vittata* of the second brood, but they were already getting worn. In the evening of the 23rd I went again to the salt marsh. *H. abjecta* were now very much worn, and the only insects I took worthy of note were *L. tauricolor* and *A. remutaria*, one of each. Larvæ of *P. egeria* in my cages had by now all pupated. Mild and calm in the evening of the 29th, with a moon at the full. I sugared posts on the downs at sunset. Several species of moths came later, but only a few of each kind. I noted *A. tragopogonis*, *C. matura*, *X. sublustis*, *L. lithargyria*, *H. abjecta*, *L. conigera*, *L. pallens*, etc. Imagines of *O. bipunctaria* in fresh condition were common on grass stems, knapweed, etc.

On August 1st I cycled to some downs 14 miles away, chiefly to get *Agriades comma*, but there was much cloud about, and consequently very little sun, so that I only obtained four of the butterfly. In addition I saw solitary *A. aglaia* and *M. stellatarum*. On the 8th I went again, and found *A. comma* fairly common, but they were getting worn, and were not worth taking for the most. Many *P. icarus*, *P. atalanta*, etc., were flying over wild thyme in sheltered hollows, and in the lanes I saw an occasional *Colias edusa*. The evening of the 10th was calm and cloudy, and there was no moon. I went to some rough ground near the coast to search ragwort bloom for moths, but I only saw a few *Agrotis puta*, *A. nigricans*, *A. tritici*, *M. chenopodii*, etc., and from restharrow a few larvæ of *H. umbra*, *M. albicolor*, etc. Imagines of *P. egeria* and *L. monacha* were now appearing in my cages. The 11th was calm and warm, with sun all day. I went to the downs in the forenoon, and found them teeming with insect life. Seldom have I witnessed a more glorious spectacle than these downs presented that day. The recent rains had kept the grass verdant green as in early spring, and had brought out the wild flowers in profusion. Over these gambolled myriads of *P. icarus*, *E. jurtina*, *A. corydon* and *Z. filipendulae*, and here and there I saw the flashing orange of *C. edusa*. On the 15th I was again on the downs, and in addition to many *C. edusa* observed numerous *Cupido minimus* of the second brood. The evenings of the 24th, 25th and 27th I spent on the coast searching restharrow for larvæ. I found an abundance of *Heliothus umbra*, *A. ochrearia*, etc., and *H. peltigera* not uncommonly. Imagines of *Luperina testacea* and *A. ochrearia* abounded on grass stems.

The evening of September 8th was mild and calm, so the downs were visited at sunset to try sugar, chiefly on the chance of turning up *Aporophylla australis*; but it was not to be, and only a few *Noctua c-nigrum*, *P. meticulosa* and *A. segetum* were attracted. I netted half a dozen *E. popularis* that flew to my lamp, and observed many *A. viridaria* of the second brood flying about bushes. On the 14th *O. cervinata* commenced to appear in my cages; also one or two of a second brood of *B. crepuscularia*.

The 19th I spent in the woods larva-beating. From beech I obtained *Drepana cultraria*, *P. betularia*, *E. linearia* and *Eurymene dolobraria*, but from other trees very little. On the 26th I dug pupæ of *Mimas tiliae* and numerous Noctuas from the foot of elms on my way to the woods, where a diligent search of *Angelica sylvestris* produced larvæ of *Eupithecia albipunctata* in abundance.

So far as the net was concerned my season had now drawn to a close, my energies hereafter being devoted to the uncertain possibilities of pupa-hunting. Perhaps the most striking feature of the season 1920 in my experience was the phenomenal scarcity of insects at light. Night after night, on my journey home to the heart of the town after a collecting expedition into the country, I passed a mile of fine electrics at what is considered the best time for taking Lepidoptera at light, viz. between midnight and 1.30 a.m., yet not once did I observe an insect worth taking. If I had wanted, for instance, to obtain a short series of those familiar insects *Agrotis exclamationis* or *Spilosoma menthastri* especially from lamps, I should have been hard put to have obtained them thus; indeed I doubt if I could. Larvæ, too, were scarcer than I have known them to be before. Otherwise the season was very fair, especially as regards some of the immigrants, which were commoner than I have observed other years, such as *C. edusa*, *P. cardui*, *P. atalanta* and *H. peltigera*; *M. stellatarum*, on the other hand, was decidedly scarcer than usual. Sugaring on the downs attracted many insects, but in the woods, for some unaccountable reason, was an utter failure.

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THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALAEARCTIC LEPIDOPTERA.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from Vol. LV, p. 270.)

Works Published in France.

Boisduval, J. A. *Icones Historiques des Lépidoptères Nouveaux ou peu connus de l'Europe*; Paris, 1832-41; 2 vols.; 84 coloured plates. This is a useful book, the plates including Rhopalocera, Sphinges, Bombyces and Noctuae, are excellent. Priced in 1913 at £3 10s., another copy £4. Dr. Chapman's copies realised £3 and £3 3s.

Boisduval. Rambur et Graslin, *Collection Iconographique et historique des Chenilles d'Europe*; Paris, 1832-37; 126 coloured

plates. Priced in 1913 at £3 8s.; another copy £4 6s.; Dr. Chapman's copy was sold for £4 15s. An extremely useful book to those who are interested in the earlier stages. The plates are very good.

Boisduval, J. A. Monographie des Zygénides; Paris, 1829; with 8 coloured plates. About 15s. Very useful to students of this interesting group.

Cantener, L. P. Histoire Naturelle de Rhopaloceres de dept. de Haut et Bas-Rhin, de la Moselle, de la Meurthe, et des Vosges; Paris, 1834; 166 pp., 38 coloured plates. A useful little volume dealing with the fauna of Eastern France. Priced in 1913 at 7s., but probably worth considerably more. My copy cost more than double this figure.

Duponchel et Guenée. Iconographie et histoire naturelle des Chenilles; Paris, 1849; 92 coloured plates. Priced in 1913 at 61s. and 63s.

Geoffroy, E. L. Histoire des Insectes aux environs de Paris; with 22 plates; Paris, 1764; about 5s. This early work is interesting to British Lepidopterists because it describes many of our species. In some cases, as in *Melitaea athalia*, it contains the original description.

Godart et Duponchel. Histoire Naturelle de Lépidoptères de France; 11 vols., with 4 vols. of supplement and 546 coloured plates. Priced in 1913 at £25 and £27 10s. A very valuable work. The plates are very carefully executed, but the colour in some of them is changed. The extremely beautiful drawings from which these plates were prepared are in the Walsingham Library, at the Natural History Museum, South Kensington.

Latreille et Godart. Entomologie hist. nat. des Lépidoptères; 2 vols.; 163 plates; Paris, 1819; catalogued at 25s. This work, consisting of the ninth volume of Encyclopédie methodique, is useful. It contains many original descriptions.

Milliere, P. Iconographie et Description de Chenilles et Lépidoptères inédits; 3 vols.; 154 coloured plates; Paris, 1859-69. Catalogued at £14 and £16. An extremely valuable work to the student, with many beautiful plates. It consists of a series of extracts from the Annals of the Linnean Society of Lyons.

Milliere, P. Catalogue Raisonné des Lépidoptères des Alpes-Maritimes; 3 parts and 2 supplements; 4 plates; Cannes, 1871-75. Catalogued at 32s. and 21s.

Milliere, P. Lépidoptérologie (Lepidopt. nouv. ou peu connus des environs de Cannes); 8 fascic.; 16 coloured plates; Cannes et Lyons, 1881-2. Catalogued at 36s. and 32s.

Both these minor works of Milliere are useful to students and to visitors to the Riviera.

Oberthur, C. *Études d'Entomologie*; Rennes, 1876-1902; 21 volumes; 142 plates (128 hand-coloured). Catalogued in 1913 at £50 and £52 5s.

Oberthur, C. *Études de Lépidoptérologie Comparée*; 1904-. Volumes are still appearing. Dr. Chapman's copy, a presentation to him from the author, sold for £43. The price now would be several times this amount.

Both these magnificently executed works, produced without regard to cost by the author, are beyond the means of most Lepidopterists, but they are the finest productions of their kind in modern times, and anyone who can afford to purchase them will rejoice in their possession.

Rambur, J. P. *Catalogue Systematique des Lépidoptères de l'Andalousie*; Paris, 1858-66; 2 parts with 22 coloured plates. Catalogued in 1913 at 40s. and 45s. This valuable book is rare and should be secured if a chance offers. It is a very valuable contribution to the fauna of Southern Spain.

Annales de la Société Entomologique de France; Paris, 1832-1922; A set was offered this year for £150. Probably, however, this is a somewhat fancy price, for in 1912 the vols. 1832-1908 were offered for £66, and in 1913 those for 1832-1902 for £55, in each case by a continental bookseller.

Belgian Publications.

Genera Insectorum: published by P. Wytsman. Brussels, 1902. Of this elaborate catalogue no less than 178 fascicules have been issued. The work, fascicules 1-133, was priced in 1913 by a continental bookseller at £92 10s. Dr. Chapman's copy complete realised only £20. The numerous plates are very beautiful, and the work to those who can afford it and can give it shelf room is very valuable.

Annales de la Société Entomologique de Belgique: Brussels, 1860-1922. A set was offered in 1922 for £30. Vols. 1860-1908 were catalogued in 1912 for £23, and another the following year containing the same volumes for £16.

Dutch Publications.

Nederlandsche Insekten: Amsterdam; Commenced by Christiaan Sepp in 1762 and continued until the present day. Vol. I was by Christiaan Sepp, Vols. II-III and the greater part of Vol. IV by Jan Christiaan Sepp. Vol. IV is said to have been completed by Jan Sepp, who also published Vols. V, VI and VII as far as *Verhandl.* 41. *Verhandl.* 42 to the end and vol. VIII were edited by S. C. Snellen van Vollenhoven. The second series were edited by S. C. Snellen van Vollenhoven, P. C. T.

Snellen and A. Brants. Parts of this series are still, I believe, issued from time to time. The last was part 8 of Vol. V dated December, 1912.

In my view the earlier portions of this work, and especially the first four volumes, contain the most exquisite plates that have ever been produced of the Lepidoptera in any country. The figures are, of course, hand-coloured, and one wants to study them with a lens to realise the absolute perfection of the drawing. Unfortunately the language in which the volumes are written, Dutch, is understood by few of us, but the volumes are most precious for the sake of the plates only. The entire work was catalogued in 1912 at £38 15s.; another set, 1762-1900, was offered the following year for £27 10s.

Snellen, P. C. T. *De Vlinders van Nederland Macro-Lepidoptera*; Gravenhage, 1867. Offered at 12s. and 8s. in 1912 and 1913 respectively.

Snellen, P. C. T. The same work on the Micro-Lepidoptera; Leyden, 1882; 2 vols. Offered at 25s. and 18s. in 1912 and 1913.

Tijdschrift voor Entomologie; Gravenhage, 1858-1922. In 1913 a set 1858-1910 was offered for £25, whilst another bookseller priced one 1858-1902, in 1913, at the same amount.

Swiss Publications.

Culot, J. *Noctuelles et Géomètres d'Europe*; 4 vols.; 151 plates; Geneva, 1909-19. Unquestionably the most beautiful work which has been published for many years on these groups of the European Heterocera. M. Culot is, of course, at the very head of the tree as an entomological artist, and the plates are hand-coloured. I have not seen a copy offered secondhand, but the cost to the subscribers was about £20. Dr. Chapman's copy, the only one that has been offered at auction, realised, as a bargain of course, £7!

Favre et Wulschlegel. *Fauna des Macro-Lépidoptères du Valais et supplément*; Berne et Schaffhouse, 1899-1903. 1 vol.; 359 pp. Catalogued at 7s. An extremely useful fauna list for those lepidopterists who visit Switzerland. Favre was one of the best known of Swiss lepidopterists, and Wulschlegel, who was responsible for most of the notes on the life-histories, was equally well known.

Scandinavian Publications.

Aurivillius. *Nordens Fjärilar Handb. i Sveriges, Norges, etc., Macrolepidoptera*; Stockholm, 1888-91; 50 coloured plates. This is, for the period in which it was written, the standard

work on Scandinavian Lepidoptera. It is priced at from 20s. to 30s.

Clerck, C. A. *Icones Insectorum*, etc., of Linné's *System Nat.*; Stockholm, 1759-64; 55 coloured plates. An extremely rare and valuable work because Clerck, who was, of course, a contemporary of Linné, figures a large number of his types. Probably as scarce and valuable a book as any that has ever been written on the Lepidoptera. It is very seldom that a copy comes into the market, and I have never seen one priced. A bookseller who had one to dispose of might ask anything from £50 to £100 for it. I only know of a very few copies in Britain, one of which is in the Library of the Entomological Society.

Fabricius, J. C. *Systema Entomologiae*; Flensburg, 1775. Priced at 8s. and 10s. in 1912 and 1913 respectively.

Fabricius, J. C. *Genera Insectorum Mantissa*; Copenhagen, 1787. Priced at 9s. and 14s. as the previous work.

Fabricius, J. C. *Entomologia Systematica Emendata et Aucta*; Copenhagen, 1792-98; 4 vols. and supplement. Catalogued in 1912 at 26s. and in 1913 at 28s.

These three works are valuable to the serious student because of the large number of types described in them.

Lampa, S. *Skandnaviens och Finlands Macro-Lepidoptera*; Stockholm, 1885. A very valuable fauna list of Scandinavia. I cannot find a price for it, but the book is not rare. My copy, picked up some ten or a dozen years ago, only cost a few shillings.

Linné, C. von. *Systema Naturae*. The basis of all zoological nomenclature. Of course every student should possess a copy. There were twelve editions, No. 1 dating from 1735, No. 12 from 1766-8, but edition 10, 1758-9, published at Stockholm, is the one which is now universally accepted as the book from which zoological nomenclature commences. Edition 11, published at Magdeburg, 1760, is, I believe, identical with edition 10 so far as matter is concerned. The original work is difficult to procure nowadays (there are modern copies of the original editions). It was catalogued in 1912, £2 14s., and in 1913 at £4. I picked up an original of edition 11 in 1919 at a price between these figures.

Linné, C. von. *Fauna Suecica*; edition 2; Stockholm, 1761; 1 vol.; 578 pp.; 3 uncoloured plates (mostly birds are figured). This book is also difficult to procure although it is only priced at about 15s. It is very valuable to the student because so many species are described in it that do not appear in *Systema Naturae*.

Thunberg, C. P. *Insecta Suecica*; 9 parts; 4 plates; Upsala,

1784-95. A difficult little book to acquire a copy of nowadays, and one which I have not been able to procure. A foreign catalogue dated 1912 prices it at 12s. It is very useful for the original descriptions and figures of Lepidoptera.

Entomologisk Tidskrift: Stockholm, 1880-1922. The Swedish magazine of Entomology. A set 1880-1905 was priced at £7 10s. in 1912, and one 1880-1909 at £6 15s. in 1913.

Russian Publications.

Eversmann, E. Fauna Lepidopterologica volgo Uralensis: 1 vol.; 633 pp.; Kazan, 1844. The standard work on the Lepidopterous fauna of these regions, and a very useful one I found it when I visited South-Eastern Russia in 1914. The work is scarce, the greater part of the edition being accidentally burnt. The volume is usually priced at from 20s. to 30s. I have a copy, once the property of the ill-fated Grand Duke Nicolai Michailovitch, and containing his bookplate.

Memoires s. l. Lépidoptères par Nicolai Michailovitch (Romanoff); 9 vols.; Petrograd, 1884-1901; 164 coloured plates, known as the Romanoff Memoires. A very fine work, dealing with the fauna of Central Asia. The value of it is about £30.

Horae Societatis Entomologicae Russicae; Petrograd, 1861-1922. The publication of the Russian Entomological Society. A set 1861-1908 is priced at £31 10s., and one 1861-1906 at £35.

Since this paper was commenced I have discovered that for 1922 and onwards the cost of the Zoological Record has been increased from 30s. to 50s. per annum, but that the Insecta portions can be obtained separately for 15s. per annum.

The date of the first edition of the Aurelian by Moses Harris is given as 1778. My attention has been called by Mr. J. Anderson, of Chichester, that this is an error, the date of this edition being 1766.

West Watch.

Limpfield;

December 2nd, 1922.

NOTES AND OBSERVATIONS.

A QUESTION OF NAMES.—If I may return for a moment to the note on p. 232 of your last volume (October, 1922), it is suggested in the note that we must say *Trochilium crabroniformis*, not *crabroniforme*, because Lewin, the first user of the name, wrote *crabroniformis*. I would point out that the specific name is an adjective meaning "hornet-like," and must agree with the generic name which it describes. Lewin no doubt called it *Sesia* (or *Aegeria*, or *Sphecia*) *crabroniformis*, which is correct, as these generic names are feminine. *Sesia crabroniformis* means "the hornet-like *Sesia*," but *Trochilium* is neuter, and *Trochilium crabroniformis* means nothing at all and is

an absurdity. If it means anything it means a *Trochilium* and something else "hornet-like," not a *Trochilium*. Surely the law of priority, carried to this extreme, stultifies itself! Lewin, who was no doubt a Latin scholar, would himself be horrified at such an abuse of his name.—E. A. C. STOWELL; Eggar's Grammar School, Alton, Hants.

[The footnote referred to was not intended to be quite so suggestive. I am glad, however, that Mr. Stowell raises this question. It is, I think, covered by Article 3 of the International Rules of Nomenclature, which runs: "The scientific names of animals must be words which are either Latin or Latinized, or considered and treated as such in case they are not of classic origin." Yet there is a good deal to be said for the opposite point of view, which was held by no less an authority than the late Dr. Sharp, that the original spelling of a name should always hold. It would save a great deal of time and trouble and only offend classical sensibilities, not entomological conceptions.—N. D. R.]

DAPHNIS NERII OFF SCOTLAND.—The date given for the capture of this specimen, recorded in the last number of the Entomologist, p. 278, should be 1907, not 1917.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

ABERRATION OF ARICIA MEDON.—On August 19th last, during an hour's collecting in Abbott's Wood, I captured on the wing a remarkable male ab. of *Aricia medon*. I have never seen a similar specimen. The markings on both upper- and undersides are normal, but the white thoracic hairs, the fringes of the wings and the entire ground-colour of the underside are dark smoky grey or lead colour.—L. F. HAMMOND; "Letchmere," Olden Lane, Purley, November 25th, 1922.

EARLY HIBERNATION OF VANESSA POLYCHLOROS.—On July 26th I took a *V. polychloros* newly emerged from the pupa. On August 11th four were given me, by a lady residing in this neighbourhood, which had already gone into hibernation in her house. They were quite torpid, and had probably been in their winter quarters some days when they came into my possession.—C. M. WOODEFORD; Partridge Green, Sussex.

HERSE CONVULVULI AT HEATHFIELD, SUSSEX.—My captures of *convolvuli* may be interesting to some entomologists on account of the dates when taken, and also because of the fact that nearly all the males were taken after the females. The first was a fine female on August 20th, followed by a female on August 30th, one on August 31st, two on September 1st, one each on September 3rd, 4th, 5th and 15th, two on September 28th, and four on the 29th—all females. September 30th, one male; October 1st, one male; October 2nd, two males; October 3rd, two females (one battered); October 5th, one male; October 6th, one battered female. All taken at bloom of *Nicotiana affinis*, and all at dusk.—E. CRISP; Heathcote, Heathfield, Sussex.

LEUCANIA UNIPUNCTA IN DEVONSHIRE.—On September 6th I was fortunate in capturing at sugar, near Beesands on the South Devon

coast, a specimen of the above species in perfect condition.—G. W. WYNN; Rosemary, Hampton-in-Arden, Warwickshire.

THIRD BROOD OF *CIDARIA TRUNCATA* IN WESTMORLAND.—To-day, December 2nd, a specimen of *C. truncata* emerged in my breeding-cage. Eggs were obtained, from a female taken at "light," on September 7th, and the resulting larvae, which were expected to hibernate, were fed on birch, out-of-doors. This one enterprising individual quickly outstripped his fellows and arrived at full growth on November 15th. The rest of the larvae are still small and are hibernating normally. I should not have considered the past season to be at all a favourable one for precocious development, but the above is only one of several instances of erratic behaviour in my larvae this year.—FRANK LITTLEWOOD; 22, Highgate, Kendal, December 2nd, 1922.

AESCHNA MIXTA, LATR., AS A LONDON DRAGONFLY.—It may be of interest to record that on September 4th last what proved to be a fine male of this species, which certainly seems to have become commoner in recent years, was observed by a bricklayer flying in the grounds of this Museum. He succeeded in knocking it down with his trowel, and the specimen has now been added to the national collection of British Odonata.—HERBERT CAMPION; British Museum (Natural History), Cromwell Road, London, S.W. 7.

BRITISH LARVAE ON THE MULBERRY.—In my garden are a couple of fine old mulberries, which bear heavy crops. The only larvae that I have ever found upon them were two highly-coloured specimens which were upon the same tree and close together. Both were hairy but not of the same species. This was many years ago, perhaps twenty. They were certainly not Ermines. Scorer's Log Book does not mention the tree. Has anyone ever found larvae upon these trees whose foliage keeps so perfect? In our silk-worm days the tree was considered very important. It would be interesting to know whether any British species have ever been found on the fig, rhododendron, magnolia, and other trees of foreign origin. The larch was introduced into Britain in 1725, and, as we know, is of entomological interest.—Dr. LOWTHER; Fernleigh, Grange-over-Sands.

NOTE ON *DRYAS PAPHIA*.—As a general naturalist I am taking the liberty of utilising your pages to draw attention to a peculiarity respecting the silver-washed fritillary (*Dryas paphia*) which seems to have escaped the notice of my entomological friends. In my youth during the 'eighties I spent several long summer holidays in North Devon, and I always found that while on my arrival, about the beginning of August, *A. aglaja* and *A. adippe* were much worn and almost over, the males of *D. paphia* were only just emerged. I think the females did not appear till a little later, and both sexes were on the wing till the middle of September, when I usually departed. I have observed the same thing on occasional visits to North Devon in more recent years, and also in 1914 at Barmouth in Wales. In most parts of England, I believe, the flight of *D. paphia* is practically contemporaneous with that of its two allies, and the fact that

in certain hilly districts of the west it is fully five weeks later seems to point to some inherent difference in the western insect. It has not been possible for me to examine a good series of specimens, but judging from the limited material at my disposal (from Surrey, the New Forest, and Switzerland) and the figures in the popular hand-books, I should say that the North Devon examples are larger, on an average, in both sexes, and are characterised by a distinctly narrower upper wing and broader lower one. In some Exmoor males the small, narrow upper and extremely broad lower wing are very remarkable. Perhaps some entomologist may be sufficiently interested to investigate this point, if it has not already been done, and to determine whether or not a local race exists which may possibly be worthy of varietal distinction.—H. W. PUGSLEY; November 27th, 1922.

NOTES ON TORTRICES OBSERVED IN 1922.—*Retinia posticana* turned up this year in a small plantation of Scotch firs in the parish of Hartlip, near Sittingbourne. The pupa agrees with Warren's description in Barrett's British Lepidoptera, being jet black and lying head downwards in a bud, which was completely hollowed out, as in the case of *R. turionella*. Through the courtesy of Mr. A. S. Webb I was able to find out the date of the planting of these trees—1914—so the species has thus been settled here for eight years, and successfully passed through the amazing heat of 1921, which appears to me remarkable in a northern species. Mr. Sheldon informs me, however, that it is extending its range throughout Surrey.

Cacoecia unifasciana.—I bred several specimens of this insect from larvae feeding between united leaves of ivy, collected at random among those of *T. forsterana*. I believe this to be a new food-plant.

Argyrolepis zephyrana.—Barrett describes this insect as double-brooded; my experience of it seems to indicate it has only one very extended brood, as specimens kept in the open air in flower-pots emerged from May 25th to August 4th. In support of this I may mention I opened scores of stems of *Daucus carota* in a locality where the species is common in mid-July without finding a trace of a larval working.

Pandemis diversana (transitana) is usually supposed to be a rare species; I was therefore surprised to find it in countless thousands in an orchard of plums planted on the site of an old wood, the remains of which fringed the orchard on one side. The pupa cases were sticking out of the twisted plum leaves in dozens. The insects were flying in hundreds round every tree, just as *C. lecheana* does a fortnight earlier, in the last week in June. I did not notice any except in this one orchard. Barrett mentions "apple . . . fruit-trees" among the food-plants, but though there were many apple-trees in the orchard I only noticed the insect on the plums, and the females were only beaten from boughs of the plum-trees.

Coccyx argyrana in this neighbourhood appears to frequent the apple orchards almost exclusively. I saw numbers flying round apple-trees about 6 p.m. in mid-May, but none in the neighbouring oak-woods, and bred one from a pupa found spun up under bark on an apple-tree, but none from oak-galls, which produced an abundance of *C. splendidulana*.

Peronea hastiana, according to Barrett, leaves the larval habitation to spin up elsewhere. This is not always the case, as several pupæ which I discovered in the larval habitation in September this year, and carefully isolated, turned out to be *P. hastiana*.

Eupoecilia roseana is also, according to Barrett, double-brooded. Again I am convinced this is a case of retarded emergence, as I bred a number this year from teazle-heads brought indoors in the middle of May. They emerged in two batches, one at the end of May and beginning of June, the second in the first week in August.

Opudia funebrana is usually supposed to be very difficult to obtain in the perfect state. It may therefore be of interest to know that I took a fair number of specimens in a shed used for storing the wicker baskets in which fruit is carried to the London markets. The larvae had obviously emerged from the plums on the railway journey and spun in the interstices of the baskets, the perfect insects being found on the glass windows of the shed the following summer. If it had been an early cherry season in 1922 the baskets would have been in use and the moths have blown away on emergence.—H. C. HUGGINS: Oldstede Cottage, Chestnut Street, near Sittingbourne.

ON THE RELATIVE SCARCITY OR OTHERWISE IN THE SEASON OF 1922 OF SOME USUALLY COMMON SPECIES OF LEPIDOPTERA.—The district covered in the following notes refers chiefly to the strip of coast extending along the front of the town of Eastbourne and the lower slopes of the Downs towards Beachy Head. Here *Pieris brassicae* is in most years a common and sometimes a very abundant species, but in 1922 it was quite a rarity. Of the spring emergence, which was first noted on May 20th, not half a dozen specimens were met with up to June 5th, when it appeared to cease. The summer emergence, which began on July 21st, was little more numerous; an occasional specimen or two, often at intervals of several days, was all that was seen during its continuance, and it appeared to terminate on September 18th. In strong contrast was the abundance of *P. rapae*. First seen on April 23rd the spring emergence continued fairly numerous until the middle of May, as did the later one from July 8th until early in August, when it increased rapidly and the species was unusually abundant from the 15th to the end of the month, after which it gradually decreased in numbers, but was seen daily more or less commonly up to October 16th. In the autumn the cabbage plants in our gardens were badly eaten by larvae—a not unusual occurrence, but whereas the damage is generally attributable to *P. brassicae*, it was found on examination that the mischief in this case was caused chiefly by *P. rapae*, from 80 to 90 per cent. of the larvae being of that species.

Colias croceus was seen on May 25th flitting about on the banks along the Parade, and at about the same date others occurred further along the coast. The later emergence was first noted on July 29th, when some three or four specimens were met with on the lower slopes of the Downs, and from this time onwards it was to be found in such situations in some numbers until October 2nd. It was never really abundant, but from the middle of August until the middle of September one might easily meet with a score or more on any

bright morning. Throughout the whole time the males appeared to far outnumber the females and only one var. *helice* came under my notice.

So long as I can remember a colony of *Argynnis aglaia* has occupied a restricted area on a lower slope of the Downs, but for several years past it appeared to be getting weaker and weaker, until to meet with two or three specimens in the course of a season was as much as one could expect. In July last, however, it appeared to have taken on a new lease of life, and on the 20th of that month I found it flying in considerable numbers, not only in its headquarters but all over the adjacent slopes, and on the 31st one strayed as far as my garden, about a mile away.

An outstanding feature of the season has been the scarcity of *Aglais urticae*, usually our commonest Vanessid. In spring two examples were noted, namely one on April 29th and the other on May 4th and not another was seen until September 18th. From then onwards until October 25th it was met with only very occasionally, and to find even as many as three or four individuals in the course of a day was exceptional. In strong contrast was the frequency with which one met with *Pyrameis cardui*, which appeared suddenly in considerable numbers all along one strip of coastline on May 24th and 25th and as quickly disappeared directly afterwards, but odd wasted specimens were to be found in the woods a few miles inland up to the middle of July. Examples of the later emergence were noted on August 11th, and thence onwards to the middle of October they seemed to be ever present. Wherever one went, whether on the Parades, along the slopes of the Downs or in our gardens, there was *P. cardui*, and often in goodly numbers. *P. atalanta* was fairly common throughout the same period but never abundant, and *Vanessa io*, not generally a common species in this immediate neighbourhood, was met with on several occasions. *Epinephele jurtina* was unusually abundant all over the district from July 1st until well into October.

The spring emergence of *Ceiastrina argiolus* was well up to the average, but the autumn, which is here usually a much smaller one, was noticeably the more abundant and extended over a full month, the most prolific period being between the 15th and 24th of August. At the end of September full-fed larvae were very abundant on the flower-buds of the ivy, but of fifty-two collected from one small patch of that plant 53 per cent. were killed by a Dipterous parasite, and I hear that other lots collected were similarly affected.

Zygaena filipendulae is here usually a common species, but during the past two seasons it has increased enormously in numbers. On June 10th, on walking over the lower slopes of the Downs, the larvae were so abundant that it was impossible to tread without crushing some, and there were even then a good many cocoons on the grass-stems. From early in July until the end of August the imagines were so numerous that practically every flower head had from four or five to a dozen individuals continually feeding at it, while others were jostling them for a place, yet with all these numbers any marked variation was exceedingly rare.

In spring one usually finds a number of Arctiid larvae on the

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Parade banks, and from them may generally rear about 80 per cent. *A. caia* and 20 per cent. *A. villica*, but from the score or more thus collected this year nothing but *A. villica* were reared, and this species has been frequently met with throughout the district, but *A. caia* seems to have been absent, nor has a single *Spilosoma lubricipeda* (*menthastri*, Esp.) or *S. lutea* (*lubricipeda*) come under my notice either in the larval or imaginal stage.

Such wide divergence in the relative numbers of closely allied species gives pause for reflection. That immigration may be the chief factor in some cases, as for instance *C. croceus*, *P. cardui*, and possibly *P. rapae*, seems practically certain, and it is quite likely that the want of it for several years in succession may have impoverished our stock of *P. brassicae*, for there appears to be some reason for believing that this species is, with us, nearing the borders of its natural geographical range and has no very secure footing here, but all these species are known migrants, and that hypothesis will hardly apply to others that are not known to be so. Again, it may be urged that meteorological conditions may be the cause, but if so why should two species so nearly allied and so alike in their life-history as *A. villica* and *A. caia* not be similarly affected? That adverse conditions at a critical time in the creature's existence may greatly decrease its numbers is very evident, and that the reverse may equally affect it in an opposite direction; but this still leaves us with such cases as the last-mentioned unsolved, and we are constrained to leave the subject with a feeling that there is yet a vast amount of observational and experimental work to be done before we shall be able to elucidate such questions.—ROBERT ADKIN; Eastbourne, December, 1922.

SOME NOTES ON BUTTERFLIES IN ENGLAND AND THE CHANNEL ISLES IN 1922.—*Pieris rapae*.—The most interesting form of this species come across during the season was that with a small but well-marked black spot between veins 3 and 4 on the hind wings (ab. *nigropuncta*, cf. Entom., 1921, p. 125). This form is clearly not uncommon where it does occur as the following figures show. During the last week of August my brother examined about thirty specimens (all there were to be seen) in a single field near Highcliffe, Hants. Of these only seven were females, of which three showed this aberration. In addition an unusual number of dwarf forms were noticed in the spring. Might not these be due to the dryness of the food-plants last autumn?

Pieris napi.—A similar aberration to the above was taken in Guernsey during August.

Euchloë cardamines.—Specimens of both sexes with a black spot at the end of the discal cell on the hind wings (cf. Entom., 1922, p. 238) were taken at three places—in Warwickshire, Oxfordshire, and Berks.

Colias croceus.—The first specimen, a female, was taken in the Chilterns on June 11th. Fresh specimens began to appear in Guernsey on August 6th, from which date it was very common. Pale female forms were, however, rare—only two specimens of ab. *pallida* and one of ab. *helice* were taken. In one male the spot on

the fore wings was only outlined by a few black scales, the centre having the normal ground-colour. The typical form was also common, but rather worn, at Freshwater, Isle of Wight, on August 28th, while a few were seen on the Hampshire coast and in the New Forest.

Polygonia c-album seems to have maintained its last year's numbers in Warwickshire, when it was more plentiful than in any previous season.

Argynnis aglaia.—The distribution of this species in the Channel Islands is of interest. Not a single specimen was seen in Guernsey or Herm, but in Sark (only nine miles from the former) it was common.

Melitaea aurinia was seen in far greater numbers than usual in the Oxford district. One specimen was taken almost in the town of Warwick, while another was taken some miles away. I know of no other records for Warwickshire.

Pararge megera.—On May 24th, near Oxford, I took a specimen in which the eye-spot on the right fore wing is only represented by the white pupil, the black being entirely absent. On the underside, however, and on the left-hand wings, the spot is quite normal.

Coenonympha pamphilus.—A specimen with the eye-spot on the underside of the left fore wings similar to that described above was also taken near Oxford on May 28th.

Thecla pruni was common in its Oxford locality this year. The habit of this species of reducing itself to rags was most noticeable! On June 21st the specimens were clearly quite fresh, but almost all were torn.

Lycaena icarus.—In some parts of Guernsey bright blue females almost entirely took the place of the typical form.

I may add that eight specimens of *Herse (Sphinx) convolvuli* were taken on a few tobacco plants growing outside the Highcliff Hotel, Hants, between August 28th and 31st. On the 30th three were taken in about three minutes, my brother having two in his net at the same time! They were all, with one exception, fairly worn.—E. BOLTON KING; Balliol College, Oxford.

VARIATION AND BREEDING OF *COLIAS CROCEUS*.—I have had a certain amount of success in breeding *C. croceus* this season, and while not obtaining any very extreme aberrations, I have a very nice range of variation; in fact, the last 29 that emerged in November might almost be said to be 29 different forms. The first batch consisted of a lot of 13, 5 of which emerged as males, 5 as females and 2 as ♀ f. *pallida*; 1 died. All the males had the filmy green scaling on the borders (referred to on p. 185, 1921, of the Entomologist as ab. *velata*). On one the yellow nervures are continued through the margin. The females are typical with the exception of one large dusky form with the marginal spots almost entirely absent and having a dusky wedge at the base of the top wings.

The next lot consisted of 9 larvae from ova laid by a wild ♀ of the *pallida* form taken by Mr. G. B. Oliver. Of these 3 were ♀ f. *pallida*, 3 males and 3 females, the *pallida* being fine and large. Two of the males had a lemon-coloured stripe along the top edge of the upper

wing about one-eighth of an inch in width. These are very large and striking specimens. The females are more or less typical. From another batch of eggs I obtained about 45 pupae, but all those that pupated on the glass of the cages turned black or shrunk and died. Four emerged as cripples, and I eventually obtained 29 imagines in November showing a beautiful range of variation. The best one is one approaching *ab. striata*, with the margin coming out in a point almost to the discal spot. Several other females approach this form in a lesser degree. Four males and 2 females are very small and of a very pale dull yellow (*ab. deserticola*?). In one of these females the marginal spots are almost absent; in fact, most of this batch have the spots very inconspicuous, and one large female has no marginal spots at all. Of the 29, 16 were females—rather a high percentage. Apart from the small ones, 8 females are very pale and dusky; the borders almost reach the spots on the upper wings and on the hind wings extend right up to the orange spot, and are very black. Is this an autumn form and therefore not often seen in England? Only 2 or 3 are bright orange. All the normal-sized males have the greenish flush and the nervures running through the margins. One large specimen has the green flush on the upper margin only, and the hind margin looks very velvety black by contrast. There is great variation in the colour and size of the spots in the margin of the hind wings of the females, and practically all have very dusky hind wings. There were no *pallida* in this batch. Several of the males have the rosy flush on the wings, and some show a suspicion of marginal spots on the hind wings similar to the female.

Forty or fifty larvae (from ova obtained from a wild female by Mr. G. B. Oliver) are now feeding up in all stages and three have just pupated. These have been feeding for some time on potted plants of clover indoors, and seem to feed in spasms. I imagine some will carry on feeding at intervals through the winter and emerge in the spring. I find that warmth and moisture is essential. If the larvae are too cold they go limp and flabby, and hang up and die, seeming to be full of liquid. They are quite sluggish and do not require a closed cage. Lucerne is preferred to clover, but unfortunately lucerne does not appear to thrive indoors.—WALTER PIERCE; The Bungalow, Terry Road, High Wycombe, December 6th, 1922.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, November 15th, 1922.*—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The Secretary announced that the Council had nominated the following Officers and Council for 1923:

Officers.—*President:* E. E. Green, F.Z.S. *Treasurer:* W. G. Sheldon, F.Z.S. *Secretaries:* S. A. Neave, M.A., D.Sc., F.Z.S.; H. Eltringham, M.A., D.Sc., F.Z.S. *Librarian:* H. J. Turner.

Council.—Robert Adkin, E. C. Bedwell, J. E. Collin, F.Z.S., J. Davidson, D.Sc., F.L.S., J. J. Joicey, F.L.S., F.Z.S., etc., F. Laing, R. Wylie Lloyd, G. A. K. Marshall, C.M.G., D.Sc., etc., W. G. F.

Nelson, Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc., N. D. Riley, Lord Rothschild, M.A., F.R.S., etc., and H. Willoughby-Ellis, F.Z.S.

Election of Fellows.—The following were elected Fellows of the Society: Messrs. A. E. Butler, "The Nook," Clevedon, Somerset; G. W. Holloway, The Hill, Amberley, Glos.; Rev. J. F. Perry, St. Anne's Priory, Edgehill, Liverpool; G. B. Ryle, Pangbourne, Berks; B. Stewart, Lovell House, Leeds, Yorkshire.

Gifts to the Society.—The Treasurer announced the bequest of £1000 by the late Mr. Hamilton Druce, the income from which is to be devoted to the Library. He also stated that Mrs. Newman had presented to the Society a portrait of the late Edward Newman, who was President of the Society in 1853-4.

Exhibitions.—Mr. C. L. Withycombe exhibited a photograph of clusters of larvae of a Cecidomyiid new to Britain, identified by Mr. F. W. Edwards as probably *Miastor hastatus*, Kieff., and the exhibit gave rise to a discussion on the phenomenon of paedogenesis, in which Messrs. Collin and Blair and Dr. Imms took part.—Prof. E. B. Poulton quoted some original field observations on mimicry in butterflies in Central Africa by Dr. S. A. Neave, and discussed the evidence from various sources respecting the insect visitors of the primrose, particularly *Bombylius*, spp.—Mr. Arthur Dicksee exhibited some aberrant examples of *Papilio* from Formosa, including a specimen of *P. horishanus*, in which homoeosis was present.

Papers.—The following papers were read: A Revision of the Australian Species of the Genus *Melobasis*, Fam. Buprestidae, Order Coleoptera, with Notes on Allied Genera, by Mr. H. J. Carter, B.A.; Description of the Pupal Shell of *Lochnocnema bibulus*, by Mr. G. T. Bethune-Baker.—S: A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—November 9th, 1922.—Mr. E. J. Bunnett, President, in the Chair.—Mr. B. Jobling, 52, Charleville Road, W. Kensington; Mr. C. H. H. Stokes, 107, Queen's Road, Upper Norwood; Mr. G. E. Bryant, 163, Gloucester Terrace, W. 2; Mr. E. Meek, 119, Kempton Road, East Ham; and Lieut. J. C. Seabrook, F.E.S., 8, Warwick Place, Belgravia, were elected members.—The President exhibited a sample of pepper on which numbers of *Ptinus tectus* (Col.) were feeding, and a spray of oak showing the operations of *Attelabus nitens* (Col.) preserved with imagines.—Mr. A. A. W. Buckstone, long bred series of *Spilosoma menthastris* from Broadstairs, including an example resembling *S. urticae* in texture and marking.—Mr. Hy. J. Turner, the forms of *Coenonympha iphis*, *C. arcania*, var. *satyrium* and var. *darwiniana*, from many localities in the Palaearctic region, and gave an account of the variation and the distinctions between them.—Messrs. O. R. and A. de B. Goodman, short series of the same forms.—Mr. W. J. Lucas read a paper on The Second Maxillae (Labium) of the Odonata, more especially as the Mask of the Naiad Stage, and illustrated his remarks with a series of lantern-slides.—HY. J. TURNER, *Hon. Editor of Proceedings*.

SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—November 18th, 1922.—First Annual Exhibition Meeting, at Shelley.—Mr. B. Morley, President, in the Chair.—The President read a short paper

on Colour Development in Lepidoptera, suggesting that fuscous and ochreous were the primitive colours in this Order, which he considered to be derived directly from the Trichoptera. Melanism might be regarded as a reversion to ancestral coloration. This view was criticised by Messrs. Porritt, H. Lodge and Smart.—Mr. W. Buckley exhibited long and varied series of *Hybernia defoliaria* and *H. aurtiaria* from Clayton West.—Mr. E. Cocker, aberrations of *Arctia caja* from Huddersfield, (1) with fore wings mostly brown, (2) with orange hind wings, (3) suffused throughout with smoke colour, (4) heavily marked with black.—Mr. T. H. Fisher, aberrations of *H. defoliaria* from Bretton.—Mr. D. Harrison, a series of *Bombycia viminalis*, var. *obscura*, aberrations of *Ematurga atomaria*, including a gynandromorphic example, aberrations of *Agrotis finbria*, *A. primulae*, *Xanthia lutea*, *X. fulvago*, *Larentia galiata*, *H. leucophearia* and *A. caja*, all from Huddersfield.—Mr. J. Hooper, aberrations of *Rumicra phloeas*, *Amorpha populi*, *Hadena monoglypha*, *Orthosia helvola*, *Miselia oxyacanthae*, *Abraxas grossulariata* (including ab. *odersfeltia*), all from Middlestown, and a dark brown *Macrothylacia rubi* ♀.—Mr. A. Kaye, *A. grossulariata*, abs. *nigrosparvata*, *lunulata* and *lutea*, from Huddersfield.—Mr. B. Morley, series of the Tortricid genera *Acalla*, *Pandemis*, *Tortrix*, *Cnephasia* and *Exapate*.—Mr. G. T. Porritt, *Spilosoma mendica*, ab. *venosa*, Tyrone, *A. grossulariata*, abs. *albo-varleyata* and *luteo-varleyata*, from selective pairings, *Larentia fluctuata*, ab. *meana*, Huddersfield.—Mr. H. Spencer, series of *Pyralidae* and *Tortricidae* from Elland, including *Cacoecia costana*, *Olethreutes nigricostana* and *Grapholitha aurana*.—H. D. S.

OBITUARY.

WILLIAM EVANS, F.R.S.E.

By the death of William Evans (at the age of 70), which occurred in Edinburgh on 23rd October last, a gap has been created in the ranks of Scottish naturalists which it will be exceedingly difficult, if not impossible, to fill. Possessing a thorough and exact knowledge of systematic zoology and botany in all their branches, his work in local natural history probably covered a wider field than that of any other writer in this or the past century. From Mammals to Protozoa on the one hand, and from Flowering Plants to Fungi on the other, there are few groups whose distribution in the northern portion of our realm was not studied by him with a care and accuracy seldom equalled and never surpassed. He was in constant touch with specialists in every part of Britain and on the Continent, and in consequence the notes he published on the occurrence and distribution in Scotland of plants or animals are of quite outstanding value.

Retiring from the actuarial profession through ill-health at a comparatively early age he was compelled to spend the greater part of his time in open-air studies, and in the cause of Scottish natural history this circumstance proved a blessing. Devoting himself especially to the working out of the fauna and flora of the Forth area

—the district immediately surrounding his home and one presenting a wide variety of topographical feature—he amassed an amount of detailed information the like of which has been seldom seen as the result of the labours of a single naturalist. This work was fittingly crowned (but not concluded) zoologically by his Presidential Address to the Royal Physical Society in 1906, entitled *Our Present Knowledge of the Fauna of the Forth Area*, in which he summarised the species of animals known to occur in the district, giving the total number of species as 6865, of which he had met with no fewer than 4250 in the course of his own investigations. He was one of the Editors of the *Scottish Naturalist*, and in both this journal and its predecessor *The Annals of Scottish Natural History* there are few papers which do not owe much to the benefit of his advice and long experience in faunal work.

But it is as an Entomologist that Evans' name will be most familiar to the readers of this Journal. His papers and notes on various groups of insects are far too numerous to refer to in this place, and indeed it is hardly necessary to give details, since his name and work are known to every Entomologist in the country.

Personally we miss William Evans as a dear and valued friend, to converse with whom was at once a privilege and a revelation. The breadth of his knowledge, his personal modesty and geniality, and a kindly sympathy with those who had the good fortune to come into personal contact with him, are factors which accentuate the severity of the blow under which we have fallen through his decease. But his labours in the cause of Scottish natural history remain as a monument to his untiring zeal and industry, and the memory of his work will long serve as an inspiration and encouragement to those who are left to carry on.

P. H. G.

H. J. ELWES.

By the death of Mr. H. J. Elwes, F.R.S., on November 26th last, at the age of 76, Entomology, no less than Botany and Ornithology, loses one of its foremost adherents in this country, and there passes one of the greatest of those traveller-naturalists who during the last century and a half have done so much both to increase our knowledge of natural history in all branches, and to further those personal relations with men of other countries on which the advance of knowledge largely depends. A man of means, and possessing great energy and self-confidence, he began when quite young a succession of journeys to different parts of the temperate and, to a less extent, the sub-tropical regions for purposes of collection and study, and continued these journeys almost without intermission until the war and advancing years put an end to them. Beginning as an ornithologist visiting Sikkim in 1870, and noticing, as have all travellers, the lavish butterfly-fauna of that country, he is said to have regretted, when working subsequently at his important paper (published in 1873) *On the Geographical Distribution of Asiatic Birds*, that he had not paid more attention to a group whose sensitiveness to environment gives them almost a paramount importance in biological study. Hence at his subsequent visits to Sikkim in the winters of 1875-6

and 1880-1 and the summer of 1886 he made, personally and by deputy, a collection which was the basis of his reasoned catalogue of Sikkim butterflies (1888), totalling 530 species. Previously (1881) he had written on The Butterflies of Amurland, N. China, and Japan, and in 1886 appeared a monograph of *Parnassius*, this being of considerable and permanent value from his careful study of the female "pouches."

He had now become a keen lepidopterist, who visited the collections, public and private, of the continent, monographed or published notes on *Colias*, *Erebia*, and *Argynnis*, and besides numerous trips to the Alps and Pyrenees, made longer ones in 1885, 1887-8 and 1893 to the United States, Mexico and Canada, accompanied in part by his brother-in-law, Mr. Godman. For the two years 1893-4 he was President of the Entomological Society, taking as the subject of his address in the latter year The Geographical Distribution of Butterflies. In 1897 appeared A Review of Oriental Hesperiadæ, in collaboration, as were also his monographs of *Ypthima* and *Oeneis* in 1893, with his curator and secretary, Mr. J. Edwards, who was responsible for the drawings, dissection, and tabulation. It made a great advance towards bringing this large and unruly family into order. The same year he was made a F.R.S.

In the summer of 1898 came a journey to the Altai Mountains of Central Asia, which was probably the most successful of all his collecting trips in obtaining new butterflies. In 1899 he was in Bulgaria, in 1901 in Bosnia, and at the end of that year began a useful journey of three months in the Andes of Chile. Here, perhaps, the botanist in him took first place, but he added also considerable light to the confused knowledge which then prevailed here of the butterfly-fauna, so much resembling in some ways that of Europe, Interesting and vivid accounts of this and the Altai journeys were published by him in the Ent. Soc. Transactions for 1903 and 1899, showing the alert, instructed and vigorous mind, as well as the zest, of the traveller. In 1903 he visited Norway, in 1904 Japan. In 1906 appeared the last of his twenty-eight entomological papers, an account of the rich collections made by the expedition of 1903-4 to Thibet.

In 1912 he visited Formosa, where he was struck, as forty years before, by the relationship shown by both birds and butterflies to those of Sikkim, his interest in this subject persisting to the last days of his life.

In 1913 he visited India once more, entering Nepal.

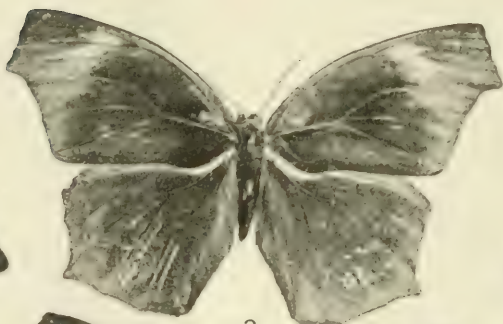
Mr. Elwes was an exceptionally generous donor of specimens to the national collection at South Kensington, and during the early years of the present century worked there a good deal on the material collected by himself and the valuable Russian collections of Grun-Grshimailo and Christoph which he had purchased. In all, fifteen species or races of butterflies bear his name, which will also be associated with the division of Asia into faunistic sub-regions, made in his paper of 1873. In addition to the butterflies he monographed one or two genera of moths which attracted him, such as *Atossa*, *Chionaema* (*Bizone*) and *Campylotes*.

H. T. G. W.

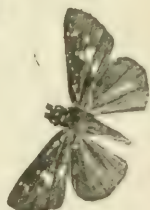




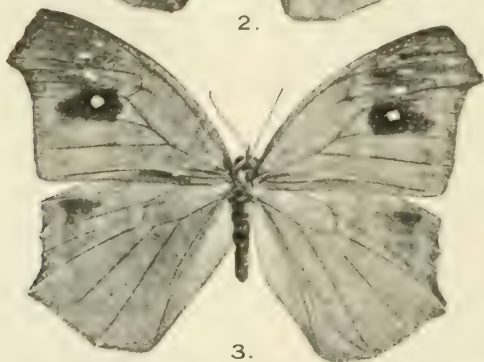
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H. G. Herring, photo.

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NEW BORNEAN RHOPALOCERA.

- Fig. 2 & 3. *Cyllogenes woolletti*. ♂ ♀
" 1. *Elymnias künstleri borneensis*. ♀
" 4. *Suada cataleucos* stgr.
" 5. *Mimambrix woolletti*. ♂

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NEW FORMS OF BUTTERFLIES FROM BURU.

BY J. J. JOICEY, F.Z.S., F.E.S., ETC., AND G. TALBOT, F.E.S.

The forms herein described were collected by the brothers F., C., and J. Pratt in the Island of Buru during 1922. The types are in the Hill Museum, Witley. Owing to lack of space the descriptions are somewhat abridged, but will be republished in full with figures in the Bulletin of the Hill Museum.

Papilio (Troides) prattorum J. and T., f. *mixtum* f. nov.

♂. Shape of wings as in *prattorum*. Fore wing with the vein stripes faintly marked on both sides. Hind wing with the base black, but to a less extent than in the *helena* form; marginal area more broadly black than in typical *prattorum*, more especially below vein 6; the tooth on vein 4 shortened and dusted with black, this being the only vestige of the black dusting seen in the typical form. The cell of the hind wing is a little broader, somewhat as in *helena*. Abdomen ventrally with only slight black hair and more yellow scaling. The claspers are grey instead of black, being a little darker than in *helena*. The yellow area of the hind wing on both sides slightly opalescent.

Hab.—South Coast of Buru; Lek Soela, Feb.–Mar., a single specimen.

This remarkable specimen partakes of the character of both *prattorum* and *P. helena bouruensis* Wall.

Delias prouti sp. nov.

♂. Upperside white. Costa and outer margin of fore wing and outer and inner margin of hind wing very narrowly edged with black. Fringes black. Underside of fore wing with black ground-colour, a grey-white basal half, and large apical yellow spots from costa to vein 3. Hind wing with a long brick-red basal stripe in 7 as in *joiceyi*, the cellule grey-white. A brick-red unbroken discal band, straighter and thicker than in *joiceyi*; this band edged proximally by a black band not exceeding it in thickness, but variable and sometimes half as wide. Basal half between inner margin and vein 7 olive-yellow; a white flush of variable extent, and mostly tinged with pink, borders the red band in the distal area, which is bright yellow.

♀. Upperside black with basal half of both wings dusted with olive-yellow, and inner margin of hind wing grey-white. Fore wing with five creamy sub-apical spots in 3, 4, 5, 6 and 8, divided by the

veins. *Underside* as in the ♂, but fore wing with larger yellow patches and darker basal scaling. Hind wing with distal area stone-grey and a narrow marginal border of yellow on the lower half.

Length of fore wing: ♂ ♀ 32-36 mm.

Hab.—W. Central Buru, Gamoe Mrapat, 5000 ft., April. A series of ♂♂ and a few ♀♀.

This very striking species is allied to *joiceyi* Talb., from Ceram.

Delias schmassmanni sp. nov.

♂. *Upperside* white with the fringes black at the veins. Fore wing with the apical margin black. *Underside* of fore wing with apical area benzo-brown (Ridgeway, pl. xlv), ground-colour black. A post-discal band of pale yellow, much broader posteriorly and joined to the white inner margin. A small yellow costal spot in cellule 8. Hind wing benzo-brown. A yellow post-discal band, deeper in colour than on the fore wing, and variable in width, broadening posteriorly to join the brighter yellow inner margin. Six yellow and rounded marginal spots, those in 2 and 3 much larger than the others. Costal edge narrowly yellow from base to post-discal band.

♀. *Upperside* white, with broad black margins. Fore wing with black apical area narrowing below vein 3, and bearing four white apical spots. Costa narrowly black, and discocellular black. Hind wing with the black outer margin narrowing posteriorly, and bearing five indistinct marginal yellow spots. *Underside* as in the ♂ but with the apical spots of the fore wing reproduced.

One specimen has a narrower black margin on the hind wing, not reaching below vein 4.

Length of fore wing: ♂ ♀ 37-39 mm.

Hab.—W. Central Buru, Gamoe Mrapat, 5000 ft., April. A small series with about an equal number of both sexes.

This species appears to be related to *manuselensis* Talb., from Ceram.

Delias apatela sp. nov.

♂. *Upperside* of fore wing with white basal half and black distal half. Two or three small white apical strigae. Hind wing white with a black outer margin. *Underside* of fore wing black, inner margin white, base dusted with yellow, succeeded by a white powdering. Five white apical spots. Hind wing yellow, darker than in *rothschildi*, but paler at the base. A submarginal black line, somewhat crenulate at its distal edge, and bordered by a white line on its inner edge. The veins between the submarginal line and margin are narrowly black.

♀. *Upperside* with white area reduced. *Underside* as in the ♂, but with the submarginal line more heavy, and some distinct discal scaling.

Length of fore wing: ♂ ♀ 30 mm.

Hab.—Central Buru : Kako Tagalao, 2700 ft., May ; Koentoeroen, 3500 ft., April ; River Pohatiga, 3000 ft., April. A small series with 4 ♀ ♀.

This interesting form closely resembles *D. rothschildi* Holl., and flies with it. It is confined to the interior, but *rothschildi* has a wider range and occurs at the coast. Easily distinguished by the uniform yellow colouring of the hind wing below and especially by the black submarginal line being narrowly edged with white on the inside.

Delias eschatia sp. nov.

♂. *Upperside* white. Fore wing with costa narrowly black, but broadening towards the black apex. Four small white subapical spots contingent upon the white area. Hind wing white but with dark underside showing through. Outer margin with a thin black line and black fringe. A narrow marginal border of black dusting. *Underside* of fore wing white, with broader costal and apical fuscous than above. Four yellowish-white subapical spots. Base dusted with yellow. Hind wing fuscous. Cellule 8 dusted with yellow, also the inner margin. A submarginal row of six dark yellow spots.

♀. *Upperside* of fore wing white. A broad costal and apical black area with five white subapical spots. Hind wing grey-white with a broad black outer margin, narrowing posteriorly. *Underside* as in ♂, but fore wing with broader apical black and larger spots.

Length of fore wing : ♂ ♀ 30 mm.

Hab.—Buru, Koentoeroen, 3500 ft., April, 2 ♂ ♂, 4 ♀ ♀.

This species is apparently allied to *stressmanni* Roths., from Ceram.

Delias vidua J. & T. ♂.

♂. *Upperside* white. Fore wing with broad black apical area and costa narrowly black. Hind wing with broad black distal area, in cellules 2 and 3 with indistinct triangular prolongations. The black dusting along the edge of the white area is more uniform but less strongly present than in *isse echo*. *Underside* with fuscous black ground-colour. Fore wing with apical area somewhat as in *echo* but broader ; proximal area pale yellow, paler still posteriorly. Five small submarginal spots in 3, 4, 5, 6 and 8, the two anterior ones the larger. Hind wing with a submarginal series of 6 yellow spots, the one in 6 the larger, the others uniform and somewhat linear. Base to near middle of cell, and cellule 8 dusted with yellow, inner margin yellow.

Length of fore wing : 33 mm.

Hab.—W. Buru, River Pohatiga, 3000 ft., April, a single ♂ only.

Now that we have the ♂ of this curious form, closely resembling *isse echo* Wall. in both sexes, we may venture to regard it as a relative of *caliban* Sm., from Brit. N. Guinea.

Dichorragia ninus Feld., *buruensis* subsp. nov.

♂ ♀. *Upperside* of fore wing with spots better defined and slightly larger. Ground-colour darker green. Hind wing darker than in *ninus*, the green markings replaced by blue and larger in the ♂, in the ♀ smaller, but owing to increase in size of the white patches. Black marginal border narrower. *Underside* of fore wing with spots distinctly larger than in *ninus*. Hind wing with blue discal spots more prominent, the white patches larger, and the black ocelli more strongly edged with lilac distally.

Hab.—West Buru; En Beloro, 1670 ft., March, ♂ ♀; Kako Tagalago, 2700 ft., May, 1 ♀.

Charaxes madensis Roths. ♂.

Entom. xxii, p. 172 (1899) (Mt. Mada, Buru).

Nov. Zool. vi, t. 8, f. 4 (1899); vii, p. 346 (1900).

♂. *Upperside* of fore wing with black ground-colour, and chestnut brown markings. Basal area chestnut-brown, joined at the submedian to a lighter post-discal band reaching vein 3; this band indistinct distally, and representing in shape and area the band of the ♀, its outer part above vein 2 only indicated by indistinct spots, its inner part more distinct, above vein 3 only indicated by a large spot in 3 and a larger one in 4. The anterior part of the band seen in the ♀ is represented in the ♂ by two ovate spots in 5 and 6, only distinct proximally. Hind wing marked as in the ♀, but the band broader and creamy-white. Distal margin narrower, and the black patches more separated by the chestnut ground-colour, which forms a darker narrower marginal edge. *Underside* walnut-brown (Ridge-way, pl. xxviii), markings somewhat as in the ♀, but no white marks. Fore wing with the post-discal line not waved as in ♀, but sinuate and curved outwardly in cellule 5. Hind wing with the post-discal band less strongly waved than in the ♀, narrower and of a darker brown than the ground-colour.

Length of fore wing: 49 mm.

Hab.—South coast of Buru, Lek Soela, Feb.-March, 1 ♂ 1 ♀; West Central Buru, Kako Tagalago, 2700 ft., April, 1 ♂ 1 ♀; Mt. Tagalago, 2000 ft., April, 1 ♂ 1 ♀; Koentoeroen, 3500 ft., April, 1 ♂.

The discovery of the ♂ of this species shows it to be a form distinct from *mars* Stgr., to which it has been assigned. Its nearest ally must be *eurialus* Cram., from Ceram and Amboina.

The Hill Museum,
Witley.

AUTUMNAL FORCING OF LARVAE OF MACROTHYLACIA (BOMBYX) RUBI.

By FRANK LITTLEWOOD.

On several occasions in my earlier days I have essayed to rear the above species, but always, I am afraid, in a careless and hap-

hazard way. Such attempts ended, as they deserved to do, in failure. Quite suddenly, this season, it occurred to me to "have another shot" at my old friend and enemy. I prepared for the struggle by reading up every account I could find, whether of success or of failure, in those valuable back volumes of the several entomological magazines. The most recent contribution, and certainly one of the most useful and suggestive, was an article by Mr. L. W. Newman, of Bexley, which appeared in March, 1917 (*Entomologist*). All these accounts laid stress upon the necessity of a preliminary exposure of the larvae to the winter's weather before forcing tactics were begun. Opinions differed with regard to moisture—one writer advocating the protection of a glass roof on the outside ventilated winter-cage; another substituting wire-gauze for the glass, and exposing the sleeping larvae to all the rain and snow that fell. But all appeared to agree that *cold* was an essential prefatory condition, if forcing were contemplated, which, I take it, is equivalent to saying that forcing should be postponed till, at earliest, January.

This year larvae of *M. rubi* were backward, owing, I suppose, to the exceptionally cold and sunless season. All of mine were fed indoors, on bramble, until October 10th, when, as frosty nights seemed imminent, and I was growing rather tired of feeding so many (some 200), I turned them out into their garden cage, reserving only 15 for the first little experiment I wished to make, which was designed to enquire whether it was possible to *prevent* the hibernation of *M. rubi* larvae by subjecting them to a higher temperature immediately they had finished feeding.

Experiment No. 1.—The fifteen larvae selected were fed in my sitting-room until October 24th, when they appeared to be satisfied. They were then put into a wood-box cage in the hearth, fairly close to the fire, the sand and moss at the bottom of the box being damped each day, so that the general surroundings of the larvae were always moist and, generally, warm. The temperature would stand at 80° F. when the fire was brisk, but in the early mornings dropped to 50° F. The full-fed larvae seemed to enjoy resting on the hot wood nearest to the fire, though the heat was, there, really considerable. In a couple of days they disappeared under the moss and curled themselves up on the damp sand.

Such behaviour was not exciting, and it looked as though the hereditary instinct of hibernation was going to prove an insuperable obstacle. At the end of a week one larva came up, wandered about for a day, then shrivelled up and died. I then found a better position I had had my eye on for some time, viz. the top shelf of the hot-water cylinder cupboard. By means of a Sixe's maximum and minimum thermometer (a most useful instrument for work of this kind), I found there a temperature ranging, as a rule, in the 24 hours,

from 74° F. to 90° F. Very occasionally the mercury would rise to 95° F., and also occasionally would fall to 70° F., but these extremes were never passed. The "fifteen" (now reduced to fourteen) were placed in a very simple cage of my own contrivance, which proved to be well adapted for the purpose. It consisted of an earthenware bulb-pot, 7 in. in diameter and 4 in. deep. To the inside of the rim I cemented a circular band of perforated zinc 4 in. deep, and on the top laid a square piece of glass. In the bottom of the pot I placed a layer of pottery, and over this 2 in. of peat-mould, which is more retentive of moisture than is ordinary garden soil. Over the peat a layer of loosely shredded moss, and the latter was sprayed freely every day. The bulb-pot stood in a shallow tray, into which I poured, occasionally, a small cupful of water. The cage was thus kept nicely moist without being soaking wet. The broken pottery was an afterthought—at first I put the peat at the bottom, but it got very wet.

The elimination of the cold early morning temperature would, I hoped, prove beneficial. Just at this time, however, my own health began to give me more concern than usual, and for a few days my poor *M. rubi* were forgotten! On November 9th, when they had been "on their own" for several days, I was able to get to them, and lifted down the cage feeling comfortably certain that they would by this time be all of them dried up and dead. To my surprise three apparently healthy larvae were roaming about on the top of the now bone-dry moss and peat, and the unmistakable ends of three cocoons were visible amongst the moss. I forbore to probe any further, but gave the whole a good drenching with warm water and replaced the cage. But I was unable to restrain my impatience, and the next day (November 10th), carefully turned out the contents of the cage, with the following result: 3 cocoons containing perfect pupae: 1 cocoon with larva about to turn (it changed successfully the following day): 1 perfect pupa lying bare on the moss, and no sign of a cocoon: 1 malformed pupa, bare like the last: 2 half-changed larvae (skin torn in places), also without cocoons—these soon afterwards died: 2 larvae, dried up and dead: 1 larva, curled up, dead and mouldy. The cocoons and pupae were removed to a similar cage which I placed in a somewhat cooler part of the same cupboard (62 - 75° F.). They were simply laid amongst the moss, and moisture was provided by a damp cloth tied around the zinc sides of the cage. At first, in addition, I sprayed the moss each day, but discontinued it later without disadvantage. The moths, when they emerged, readily found a foothold on the perforated zinc, and dried their wings without mishap. But I am anticipating. The three healthy larvae were replaced under the same conditions. These made no attempt to spin: one dried up on November 23rd, and the others

by the 26th, notwithstanding the fact that the cage was now being kept constantly damp.

I was by no means displeased with this first, only partial, success, for to have five perfect and healthy pupae on November 11th, a date when quite a number of the larvae outside had not entered into hibernation, was clear proof that it was possible, by suitable stimulation, to induce a proportion, at any rate, of one's *rubi* larvae to go right ahead with their transformations and to forego their natural winter's sleep. Also that the treatment hitherto accepted as a *sine quâ non*, viz. the exposure to severe cold before forcing, whilst, possibly, the least risky course, was not the only one, and certainly not the most speedy. I felt sorry that I had not been bold enough to begin with a larger number, for any further experiments I might now make would be modified by the consideration that the larvae, though they could hardly be said really to have begun to hibernate, yet had experienced cold in their outside cage. Still, the fifteen that had formed the basis of my first experiment were above suspicion, and had never experienced a temperature lower than 50° F. The first imago emerged on November 23rd, a fine and perfectly developed male, having been just about a fortnight in the pupal state.

So ended experiment No. 1, the conditions being heat and moisture combined (but with a short period of drought !). The result gave $33\frac{1}{3}$ per cent. of good pupae.

Experiment No. 2.—It had been in my mind from the first to try one small batch of larvae in a perfectly dry and high temperature, and attempt to learn whether, in the forcing of a larva like *M. rubi*, moisture really was an inseparable accompaniment of heat. On the face of it this experiment seemed preposterous—90° F. or over, and no moisture to temper it ! If the larvae should live long enough to spin up, surely they would perish in that critical period when they were resting in the cocoons awaiting the change ! But I had never forgotten an *A. atropos* pupa which, in my early days, I had successfully forced in a dry tin, on the top of a bakehouse oven, at a steady temperature of about 80° F. ! And now, when I pondered over the result of my first experiment with *M. rubi*, the thought took shape that the few larvae that had pupated had done so, not whilst I was watering and tending them, but during the particular few days when they were being neglected, and the cage had gone dry !

So, on November 13th, I took eleven larvae from their outside cage. They were still roaming about on the top of the moss, and had not even yet decided to hibernate. I confined them in a muslin-covered bulb-pot, filled only with perfectly dry moss, and, placing this very primitive cage on the cylinder top, left the poor larvae to their fate. I did not look at them (*dared* not, in fact !) until Novem-

ber 16th, but on that day I could see the upper end of a cocoon protruding from the moss: and on the following day, without disturbing the moss, I was able to count five cocoons in process of formation. Clearly the larvae were going strong so far, which was distinctly gratifying, but perplexing, too, when I discovered, a few minutes later, that a further twelve larvae which had been put into a second *damp* cage (No. 1a), on the very same day (November 13th) had made no move at all, and were sleeping peacefully on the surface of the damp peat underneath the moss: and this though their cage had stood side by side with the dry one, in the same temperature.

On November 19th, just six days after the larvae were put in, I turned out the dry cage and found the following: 7 cocoons containing perfectly formed and very vigorous pupae: 1 cocoon with a larva about to turn (it changed next day): 2 larvae dried up and dead: 1 larva, apparently all right then, but it dried up in a few days. Well, eight good pupae out of eleven larvae (73 per cent.), and with such simple treatment (almost a lack of treatment, one might say!) seemed more like business, and it began to look as though dry heat was the stimulus they required: but even with the pupae lying before me I could not bring myself to believe so much without another trial: for it was directly opposed to all my previous experience with other larvae. However, I set going a second "dry" cage with ten larvae, and did not touch it until November 29th. Then (and I confess I feel yet completely bewildered by the entirely different behaviour of the two cages under exactly similar conditions!) I found a result such as I *expected* in the first "dry" cage but did not see—viz. a mass of fine cocoons at the bottom, but in everyone a larva that had *failed* to turn; two only formed pupae in separate cocoons, and these two none too lively, and three dried-up larvae.

This was a distinctly bad finish, and hardly knowing whether to feel disappointed or relieved I turned to the examination of the second "damp" cage (No. 1a). Here a move had been made since the 16th, and I soon picked out six really nice active pupae, all in short, compact, well-spun cocoons (*all* the cocoons were quite short, only just longer than the contained chrysalis, but the earlier ones had been of a poor, thin, open texture, and the silk almost white—as if the silk-producing material had been in scanty supply). In addition there were still four perfectly bright and healthy larvae sleeping below the moss, and only two dead ones. The combined heat and moisture was certainly working better in this cage, but I had attended to it very carefully all the time, and from beginning to end it had had steadier and more consistent treatment than the first "damp" cage. I replaced the four larvae. Had the nights been colder I would have put them outside overnight before replacing them (following Mr. Newman's method), but just at this time

the weather was quite mild, so there was nothing for it but to put them back and hope for the best. Previously, though, the laggards had always come to grief.

My next experiment will be dry heat for the first four days and then a moist atmosphere to change in, for of this there is no doubt—the larvae did spin up sooner when the damp was withheld. Mr. Newman's, in a damp cage, began to spin on the second day (earlier than any of mine), but they had been outside for several months previously, which might have made a difference. I intend to continue these trials during the winter, with, of course, any variations that suggest themselves; but for the present place on record the results, good and bad, so far as I have gone, in the hope that other collectors, who may have *M. rubi* larvae in their possession, and who are, perhaps, wondering just how to deal with them, may gather encouragement or warning from my somewhat "mixed" experience.

22, Highgate,
Kendal.

THE WING VENATION OF *RAPHIDIA MACULICOLLIS* STEPHENS.

BY C. L. WITHEYCOMBE, M.Sc.

SINCE the pupal tracheation of the Raphidiidae has as yet not been worked out, it appears desirable that the wing-venation of this family should be placed on the same basis as that of the other families of insects, in accordance with the Comstock and Needham system.

First, however, I would remark that in giving an account of the wing-venation of the Coniopterygidae (Entomologist, 1922, p. 224), I omitted to state that the reduced hind wing of *Conwentzia* is clearly a specialised condition, and therefore the actual positions of the respective tracheae are not of fundamental importance. It would be going too far to suggest a terminology strictly in accordance with pupal tracheation in this case. Indeed, as Comstock has pointed out (Wings of Insects, p. 24), tracheation cannot be followed blindly; there are bound to be some cases of specialisation. I would, therefore, now take this opportunity of pointing out my previous omission.

The wing-venation of *Raphidia maculicollis* is interesting in many respects, but differs little, except in detail, from the suggested terminology of Comstock (1918). I have examined three pupae of this species, in all, six pairs of wings.

There is a great tendency of the veins to branch at their extremities, this "twigging" being most noticeable in the hind wings.

Examining the fore wing first and comparing the pupal condition

with the later imaginal venation, it is to be noticed that Cu_1 coalesces twice in its course with M and M_{3+4} for a short distance. Cu_1 is

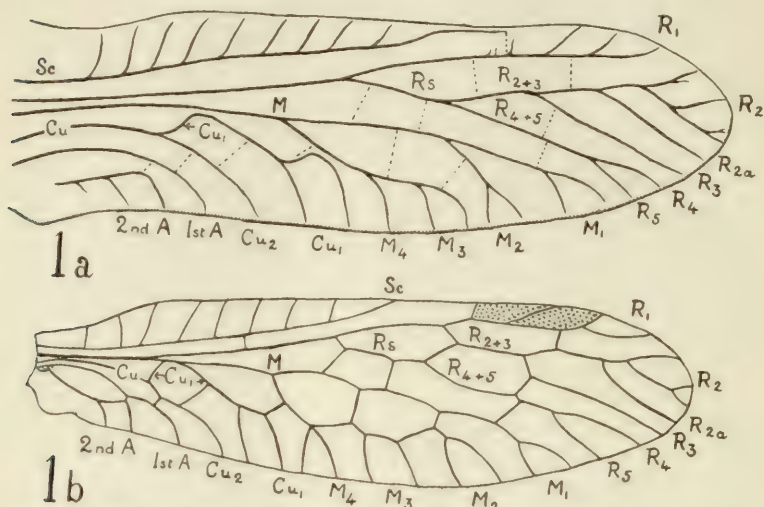


FIG. 1A.—Fore wing of pupa of *Raphidia maculicollis* ($\times 40$) showing tracheation. FIG. 1B.—Fore wing of *R. maculicollis* imago ($\times 8$).

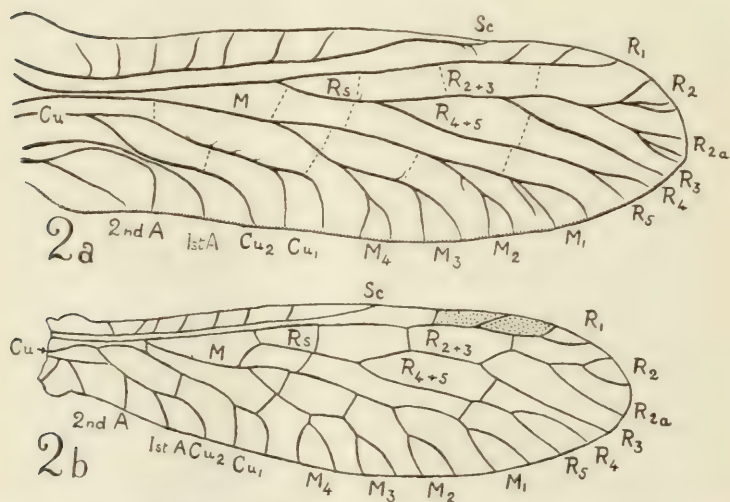


FIG. 2A.—Hind wing of pupa of *Raphidia maculicollis* ($\times 40$) showing tracheation. FIG. 2B.—Hind wing of *R. maculicollis* imago ($\times 8$).

very puzzling. In the pupal wing it has always been found to be two-branched, there being no trace of a third branch in any specimen,

but in the imaginal wing Cu_1 is three-branched. Cu_2 is unbranched. The two anal veins are free.

In the hind wings Cu_1 and M do not coalesce at any point, but are connected by cross-veins. Cu_1 is two-branched near its extremity. Cu_2 is again simple, but about the middle of its course it fuses with 1st and 2nd anals. Thus the three veins in the imaginal wing are for a short distance as one.

There is no need to discourse further; the corresponding veins are labelled in the accompanying camera-lucida drawings, which will explain themselves.

NEW RHOPALOCERA FROM BORNEO.

BY N. D. RILEY.

AMONGST a large collection of Rhopalocera recently made by Mr. G. F. C. Woollett in British North Borneo, some few forms appear to be undescribed. Mr. Woollett has very generously presented practically the whole collection to the Natural History Museum, S. Kensington, including the types of the new species and sub-species mentioned below.

SATYRIDAE.

Cyllogenes woolletti, sp. n. (Pl. I, f. 2 ♂, 3 ♀.)

♂. *Upperside, both wings*: Rich dark velvety brown. *Fore wing*: A large triangular subbasal patch of modified scales, occupying the bulk of the posterior half of the cell, its outer edge running thence from lower cell apex perpendicularly to the inner margin, to vein 2, thence parallel to inner margin to the median vein; below this black patch is a further oblong area of brown modified scales of a silky texture extending beyond the distal edge of the black patch but not commencing so near the base of the wing; midway between these and apex runs a transverse concentric diffuse blueish band, its edges shading off to purple, which colour also faintly tinges the greater part of the distal half of wing. *Hind wing* without markings, the margins between veins 2 and 6 tinged with purple, the costal area shiny, very pale ochreous. *Underside both wings*: Pale ochreous densely covered with short ill-defined dark brown strigae, especially noticeable on costa of fore wing. *Fore wing* with areas 1a and 1b grey, and indications of pale spots, marked on either side by dark points, in areas 2 to 6. *Hind wing* with similar indications in areas 2 to 4, and the dark strigae most prominent in distal half, dividing the wing into lighter basal and darker distal halves.

♀. *Upperside, both wings*: Light fuscous, the margins tinged with ochreous. *Fore wing* with a large black patch occupying the bulk of area 3 and containing centrally a pure white spot: above this a dark shade containing three small narrow whitish spots, the upper

two palely blueish. *Hind wing* with a blackish shade distally in area 5. *Underside, both wings* as in the ♂, but much less heavily covered with dark strigae, and these arranged in five ill-defined parallel bands, of which the fourth (from base) is the most prominent.

Type ♂. Bole, 4000 ft., July, 1920; ♀, Lantikan, 5000 ft., 30.4.17 both in B.M. Paratypes 2 ♂♂, Liontika, June, in Hill Museum. All Province Clark, Br. N. Borneo.

Elymnias künstleri borneensis, subsp. nov. (Pl. I, f. 1.)

♂. Differs from typical *künstleri* in that the whole of both wings above are unevenly diffused with smoky-brown, upon which the dark-brown markings, somewhat larger than in *künstleri*, show up rather less conspicuously. The marginal markings, especially of the hind wing, are much heavier. In the hind wing, in fact, the transverse striations are so numerous that, together with the dark marks on the veins, they reduce the white area to a series of small marginal irregular spots giving the margin a chequered appearance. The fore-wing costal markings are very little different: the areas 5-10 remain the least obscured. On the *underside* the differences are much less marked. The ground-colour is hardly at all darker, the dark markings scarcely, except marginally, any heavier, but the short curved discal series of internervular pale evanescent blue spots present on both wings, but largest on the hind wing, in *künstleri*, is entirely absent in *woolletti*.

Length of fore wing 5.6 mm.

The type and only specimen was taken at Mt. Lupasan, 7 miles S.E. of Bole, Province Clarke, Br. N. Borneo, during September, 1918 (wet season), at an elevation of about 4000 ft. The occurrence of this species in Borneo is of peculiar interest. The first specimen to be obtained came from Malacca, and was named *Künstleri* by Honrath, and is now in the B.M. The second specimen, representing a very distinct local race, was captured in W. Java by Herr Fruhstorfer, and described as *E. künstleri gauroides* by him. It differs from the type in the opposite direction from *woolletti*, being apparently much paler and less heavily marked, and very much smaller. The male is not yet known, all three specimens so far captured being females. Possibly *künstleri* may prove eventually to be only a ♀ form of some well-known species, but there is no direct evidence of this at present. The species must be extremely rare, in spite of its very wide range, or else so good a mimic of an *Ideopsis* or *Hestia* as to have escaped attention so far. But Mr. Woollett tells me that it was not found with any *Hestia*, nor is any *Hestia* known to occur in the neighbourhood. It was seen twice, only in very wet weather, in dense virgin jungle, between 9-10 a.m.

LYCAENIDAE.

Everes tuarana, sp. n.

♀. *Upperside, both wings*: Almost uniformly pale greyish brown, a darker anteciliary line, the cilia almost white, markings of underside faintly visible above. *Fore wing*: Distal area, especially apex, darker. *Hind wing*: An inconspicuous marginal series of black spots, most prominent in areas 2 and 3, surmounted inwardly by pale orange in areas 2 and 3 and by pale grey elsewhere, and bordered distally by a fine white line. *Underside*: The markings as usual and well developed for the genus, but the dark markings grey, not black, except distal costal spot of hind wing, the discal series much approximated to the marginal.

Length of fore wing 8.5 mm.

Type. 1 ♀, Tuaran, Br. N. Borneo, September, 1914, G. F. C. Woollett.

Most closely allied to *E. rileyi*, Godf. (J. N. H. Soc. Siam, 2, p. 135, 1916; 4, pl. 7, figs. 4, 5, 1921), but barely half the size, and readily distinguished by the grey basal spots of the hind wing underside.

HESPERIDAE.

Mimambrix, gen. nov.

Antennae not quite two thirds length of costa, curved tip of antenna half as long as club. Palpi with second segment large and densely hairy, not pressed closely against frons; the third segment long, slender, suberect (as in *Suastus gremius*, F.). Epiphyses present on the fore tibiae, medial spines present on hind tibiae. Vein 5 of fore wing at origin equidistant from vein 4 and 6; just beyond origin nearer to vein 6; for the greater part of its course nearer vein 4. Vein 3 of fore wing from just before cell end; vein 3 of hind wing from cell end. Vein 2 of fore-wing arising slightly nearer end of cell than base of wing.

Has much the appearance of *Parnara* or *Zographetus*, and belongs to Section A of the Pamphilinae of Watson's Classification of the Hesperidae.

Mimambrix woolletti, sp. n. (Pl. I, fig. 5.)

♂. *Upperside, both wings*: Very dark brown. *Fore wing*: Three very small subapical spots, of which the middle spot is much the smallest; two at cell end, the upper one minute, the lower subquadrate and about one-fourth the size of spot below it in area 2; and a small spot towards base of area 3, all translucent. A pale yellowish quadrangular spot in area 1b resting midway along vein 1. Cilia deep brown. *Hind wing*: Cilia ochreous; long hair scales about base, centre, and towards inner margin slightly greenish. *Underside, fore wing*: Costa, apical area and hind margin as far as vein 3 bright ochreous, tinged with ferruginous at, and proximal to the subapical spots; central parts of areas 1a, 1b whitish, extending to margin in 1a; remainder of wing blackish; translucent spots as above but silvery; cilia dark brown, darker at the extremities of the

veins, anteciliary line narrow and black. *Hind wing* bright ochreous, the distal half faintly tinged with ferruginous, abdominal area greyish ochreous, a small black dash basally in area 7 and similar markings in area 1c just below origin of vein 2 and in lower angle of cell; a discal series of 4 silver spots (reminiscent of those in *Iambrix salsala*, M.), of which the smallest is in area 1c, the largest by far in area 7, the other two being in areas 2 and 5, each edged with black, which is produced in the form of a wide tapering ray towards margin; similar black marks in areas 3 and 6; cilia ochreous, anteciliary line black.

Length of fore wing 13 mm.; antenna (to curve of club) 8 mm.; curved portion of club 1 mm., remainder 2 mm.

Type: 1 ♂. Bole, Prov. Clarke, 4000 ft., 12.6.1915.

Hasora woolletti, sp. nov.

♂. *Upperside, both wings*: Uniformly dark brown without translucent spots or sex-marks. *Underside, fore wing*: Lighter brown, a pale area along inner margin, much extended distally; costa broadly green, changing to blueish green apically, which extends as far as vein 3, the blue being deepest along the edges and in an ill-defined patch a little beyond apex of cell. *Hind wing*: Grey-green, a broad post-discal faintly paler area from costa towards anal angle; area 1b pale blue with a pinkish median stripe and distally occupied by a large black marginal spot, half of which lies in area 1c, where it is surmounted by a small oblong white spot. No pale cell-spot.

Head, thorax and abdomen above dark brown, the head and thorax tinged with bronze green. Thorax and abdomen below greyish ochreous, legs lighter. Palpi, except third segment, pale ochreous, with a lateral dark stripe.

Length of fore wing 25 mm.

Type: 1 ♂. Bole, 4000 ft., Prov. Clarke, 13.11.14; *Paratype*: ♂. Borneo (Waterstradt) in the Hill Museum.

The underside closely resembles that of *H. celaeus* Cram. but the upperside is devoid of any sex-mark, by which, and by its green rather than blue underside, it is easily distinguishable from *H. lugubris* Bois and *H. violacea* Stgr.

Fig. 4 represents a ♂ of *Saada catalencos* Stgr., the description of which had not been seen when the plate was made up.

B.M (N.H.);

20.1.23

ENTOMOLOGY IN THE HOLY LAND.

By CAPT. P. J. BARRAUD, F.Z.S., F.E.S.

(Continued from Vol. LIII, p. 227.)*

RHOPALOCERA.

SINCE my previous notes I have been able to make observations on the distribution of some additional species. When travelling

* The delay in publishing this continuation of Capt. Barraud's article is much regretted. The MS. has been mislaid and only recently came to light again.—ED.

long distances by car, a bag containing a folding net, boxes, tubes, etc., was carried, slung to the hood of the motor. Opportunity could then be taken of short halts necessitated by tyre trouble or overheating of the radiator.

Euchloë cardamines turritis was seen fairly commonly from the middle of March, for several weeks, along the central mountain chain, from Rosh Pina, seventeen miles north of Tiberias, near the upper Jordan, southwards through Nazareth and Jenin.

Papilio machaon was first seen on Mount Carmel on May 11th at about 500 ft. Subsequently a few were taken at Nazareth. On July 30th one or two were seen in the hills north of Tiberias, and on August 10th one specimen between the upper Kishon and Jenin. The last-named appeared to be in very fresh condition and I think must have represented a second brood. [Capt. Barraud sends a "typical occurring form" with the discoidal black marking united to the marginal spots in the band of the hind wing; this is the form misnamed ab. *sphyrus*, Hb.—H. R.-B.]

Melanargia titea titania common and distributed along the hills from 100 to 2000 ft. above sea, appearing early in May and continuing for some weeks.

Pontia daplidice pontica and f. *raphani* (gen. aest. ?).—[This appears to be the form submitted to me by Capt. Barraud.—H. R.-B.]—Abundant in fields and upon grassy slopes on the hills in May and widely distributed.

Thecla spini and *T. ilicis cerri* were captured between the 11th and 23rd May, the former on the slopes of Mount Carmel, and the latter amongst bushes in a deep gully running into that mountain.

Epinephile telmessia occurred not uncommonly in grassy spaces and amongst bushes on the northern slopes of Carmel, appearing during the first part of May.

At Nazareth, on April 14th, a few *Melitaea trivia* were taken. Other captures at that place in May include *M. phoebe*, *Carcharodus alceae*, *Pyrgus orbifer*, *Scolitantides baton*.

The Lycaenidae have not appeared in large numbers except in the case of one or two species, viz. *jesous* (*gamra*, Ld.), *Chilades phiala*, Gr.-Gr., *P. icarus* (*persica* ?), which were seen swarming amongst bushes on the plain north of Acre on July 21st.

S. baton was seen in small numbers on Mount Carmel towards the end of May, and the following at Nazareth at about the same period: *S. baton*, *Chilades trochilus*, and *C. phiala*.

One of the commonest butterflies in high summer is *Teracolus fausta*, which may be seen everywhere both on the hills and in the plains, and from the coast into the interior.

In the Kishon plain and that north of Acre *Danaïs chrysippus* appeared in July in some numbers. I have not observed this species very far from the coast. At the same time there appeared a fresh

and numerous emergence of *Pyrameis cardui*, and of *Colias edusa* in smaller numbers.

Other odd captures in the plains include *Adopaea hyrax*, *Pyrgus sao* and *Gegenes nostrodamus*, the last-named near Tiberias on July 29th; *Belenois mesentina*, *Heodes phluca*, *H. thersamon* and *Melitaea trivia*, gen. aest.

Whilst paying a visit to Athlit on July 24th I found *B. mesentina* and *T. fausta* flying in numbers amongst the ruins of the Crusader Castle on the sea-shore. An odd specimen of *H. thersamon* was netted on the sandhills at the same place.

HETEROCERA.

Of the **Sphingidae** only a few specimens were taken and of these two species have at present been identified.

Theretra alecto cretica, Bdv., was taken in September, 1919, and August, 1920, at Haifa. *Macroglossum stellatarum*, L., is one of the commonest moths, appearing in large numbers in late summer and autumn.

Ocnogyna loewi, Zell., and *Utetheisa pulchella*, Linn., belonging to the **Arctiidae**, appeared to be fairly common. The former was taken at light at Haifa from November, 1919, to January, 1920, and the latter was seen at Athlit in August, 1920, flying at sunset near the sea-shore, also at Haifa and in the Kishon plain.

Other captures at Haifa were *Lemonia sacrosancta*, Pungler (Iris, vol. xv, p. 144, pl. vi, fig. 14 [1902]), 27th January, 1920; and another species provisionally identified as *Lymantria lapidicola phoenissa*, Roghn., July, 1919, and July, 1920.

Noctuidae.—The following were taken at light at Haifa in 1920, except where otherwise mentioned:

Leucania loreyi, Dup., May, and Kishon plain, common; *Lycophotia (Agrotis) saucia*, Hon., June; *Euxoa (Agrotis) segetum*, Schiff., May; *Agrotis ypsilon*, Rott., Nazareth, April; *Heliothis peltigera*, Schiff., Kishon, May; *Chloridea hyperici*, Schiff., Mount Carmel, May; *Orthosia pistacina*, F., January; *Acontia lucida*, Hufn., form *albicollis*, F., May; *Miana literosa*, subsp. *subarcta*, Stgr., May; *Caradrina erigua*, Hon., May; *Euphesia (Catocala) disjuncta*, var. *separata*, Frr., June; *Pandisona anysa*, Sn., May; *Parallelia algira*, L., fairly common in July and August, but usually damaged; *Arenostola phragmutulis*, Hbn., August; *Poricyma albidentaris*, Frr., August.

Geometridae.—Since the publication of my notes (Ent., liii, October, 1920, p. 225) Mr. L. B. Prout has most kindly worked out further material sent to him. His remarks on various forms and local species, quoted below, have added greatly to the interest of making the small collection. Nearly all the specimens taken at light at Haifa were captured either in my own tent, or in the officers'

mess, military hospital, where I was stationed at times. Palestine is a poor country from a lepidopterist's point of view, owing chiefly to the total absence of forest or woodland, one might almost say of trees. Its geographical position, however, makes it interesting to the student of distribution.

In January, 1920, *Larentia clavaria* (= *cervinata*, Stgr. Cat.) var. *pallidata*, Stgr., was taken at light at Haifa, and one specimen probably of this form was netted at Beisan, 400 ft. below sea, when flying amongst mallow on the 6th of that month. This is described as "a curious suffused aberration" and "rather puzzling and may possibly prove something fresh. It is rather uniformly dusky, quite a contrast to the usual '*pallidata*' form, and certainly not deserving that name. The wings look a trifle short and broad for this species." *Gymnoscelis pumilata*, Hb., came to light in January at Haifa, and appeared again in numbers in May. The series did not show any striking variations. The only other species taken at light in January was *Cidaria* (*Orthonama*) *obstipata*, Fb. (This was also seen in the Citadel, Cairo, Egypt, in May.)

Towards the end of February *Cidaria salicata*, Hb., var. *ablutaria*, Bdv., came to light. "As the male antenna has longer pectinations (cfr. P. Schulze, Ent. Zeits. Guben, ix, 21), this ought probably to be treated as a species rather than 'subspecies,' especially as the range of the two seems to overlap in Switzerland; *ablutaria* is chiefly southern (south-east France to Mesopotamia); true *salicata* alpine, and boreal (Britain, Belgium, and through the Alps to the mountains of Hungary); *probaria*, H.-Sch., if not distinct from both, will no doubt prove a whiter form of *ablutaria*, but the group still needs much study." The *ablutaria* form was also taken at Nazareth in February, and at Haifa in March.

(To be continued.)

NOTES AND OBSERVATIONS.

1922 RECORDS OF LEPIDOPTERA IN THE COVENTRY DISTRICT.—I must give *Carterocephalus palaemon* and *Colias hyale* the place of honour among the 1922 records, as they have never before been recorded for Warwickshire. I took *C. palaemon* in Bubbennall Glade on Monday, June 5th, and *C. hyale* flying along the hedgeside on the Oxford Road, about 3 miles from Coventry, on Saturday, September 2nd. *Colias croceus* is another species which paid us a welcome visit in considerable numbers and in various localities in the neighbourhood, notably at the same place and date as *C. hyale*: while Mr. E. Sills, of Coventry, took several specimens at Stonebridge. *Polygonia c-album* was fairly plentiful in and around Bubbennall Glade.

Melitaea aurinia.—There has been a remarkable appearance of this species in this neighbourhood, the last record for it being 1882. Mr. E. Bolton King says he knows of no record for Warwickshire, other than his own from Warwick. It also occurred in a field on the outskirts of Ryton Wood, about $4\frac{1}{2}$ miles from Coventry, on Tuesday, May 30th, where I saw altogether about 20 or 25 specimens, and Mr. E. F. Nicholls, to whom I showed them, took one small specimen on Sunday, May 28th, at a spot about 1 mile away from my locality. On Sunday, June 4th, while in Frankton Wood, I caught another; on June 5th I took two more in Wattenbury Wood which adjoins the Glade, but released them owing to their condition; I also saw two fly past me at Stretton on Dunsmore on the above date, and single specimens at Brinklow and Cathirons on May 31st. These are my own records. Other records are: My companion at the Glade during the Whit week, Mr. F. Bonham, took several specimens, and Mr. Sills, of Brays Lane, Coventry, took two perfect insects at Coombe Wood on June 11th.

A remarkable winter emergence.—On Sunday, December 17th, with a friend, I was digging for pupæ at some poplars at Willenhall, about $2\frac{1}{2}$ miles from Coventry, when I was astonished to see resting on the bole of the poplar I was digging a female Poplar Hawk Moth (*Smerinthus populi*), very much crippled, owing to the cold I suppose, but very much alive. This is to me very remarkable, as I know of no other record of a wild specimen emerging at so late a date. I kept it alive until January 1st. —FRANK PEPPEY: 40, Blythe Road, Coventry.

UNUSUALLY EARLY OCCURRENCE OF PYRAMEIS ATALANTA IN 1922. —Early in April I observed battered and obviously locally hibernated specimens of *P. atalanta* in some abundance, capturing a few females; and during May the larvae appeared in profusion in all likely spots, their "nests" being impossible to overlook amongst the young nettles, particularly on the road and lane sides. In course of time I collected about a hundred, and actually had full-fed larvae and pupæ by the end of the month, and imagines in early June. The variation in colour of the larvae was more pronounced than I had noted before, ranging from very pale grey-green to sable black and vivid yellow, but I secured little variation in the perfect insect. —B. PRITCHARD; Headingly, Post Hill, Shrewsbury.

COLOUR VARIATION OF MELANARGIA GALATEA.—Last year in a series of *M. galatea*, taken from a locality in the Chilterns, the males are all very yellow, while others from a second locality in the hills are cream coloured.

This year, out of a short series obtained at Swanage, two males have a small patch of yellow near base of one fore wing. The patch is so sharply defined from adjoining colour that it looks like a stain. None of the insects were closely examined before being killed.

I know that the ground-colour is sometimes yellowish, but should be glad to know whether cyanide (perhaps only under certain conditions in the bottle) has been proved, either uniformly or partially, to affect the colour of *M. galatea*. —S. B. HODGSON: 3, Bassett Road, N. Kensington.

HYBRIDISATION IN NATURE.—In addition to several notes on this subject published during 1922 in the Entomologist the following may be of interest. Whilst collecting in the New Forest in July, 1922, with Mr. G. B. Coney and Mr. Tom Coney, the latter took *Epinephele jurtina* L. ♂ × *E. tithonus* L. ♀ *in cop.* Six eggs resulted, but Mr. Coney was unsuccessful in obtaining larvae from them. The other instance was near Cogley Wood, Bruton, at the end of June, when I took *Z. filipendulae* L. ♂ × *trifolii* Esp. ♀ *in cop.*, the female producing 93 sterile eggs. This is of interest inasmuch as the usual cross-pairing between these species (producing ab. *Hyb. tutti* Rbl. = *hippocrepidis*, Steph.) is *trifolii* ♂ × *filipendulae* ♀.

Polygonia c-album L. ab. *f-album* Esp. in Somerset.—A specimen of the melanotic form of *c-album* referable to Esper's *f-album* was taken by me in Cogley Wood, Bruton, on July 27th last. The season's history of *c-album* in the district is as follows: One or two hibernated specimens in late May. A single fresh specimen July 1st, abundant July 20th–August 10th (including a single ab. *hutchinsoni*, Rob.), and a very few of the autumn brood in late September.

Calotropis procera R. Br. as a Food-plant.—In southern Egypt the Hemipteron *Lygaeus fulvipes* Dall, almost certainly feeds on *procera*. It is only found on this plant, and nearly always appears on it whether it is growing amongst other vegetation or in isolated patches in the desert. The larvae of *Danaus chrysippus* L. feed only on this plant in this district and cannot be induced to eat any other local plant. The flower-heads of *procera* prove very attractive to numerous Diptera and Hymenoptera, and are a most valuable collecting ground. *Procera* is also well worth examining for Coccinellidae, many species of which frequent it.—KENNETH J. HAYWARD; Bruton, Somerset.

PRESERVATION OF RARE SPECIES.—It is a pity that no such law exists in this country for the protection of our rare insects from the predations of a certain type of collector as is evidenced by the following extract from a German entomological publication: "By a Police Order . . . of 30th June, 1921, *Parnassius apollo*, *P. mnemosyne* and *Mantis religiosa* in Prussia are placed under protection. It is forbidden to trap, deliberately to disturb, to take steps liable to lead to their capture, to capture or to kill these insects. It is further forbidden to hold them for sale, to buy, to sell or to transport them."—N. D. R.

THE RELATIVE ATTRACTIVENESS OF VARIOUS KINDS OF LIGHT FOR MOTHS.—Having regard to the correspondence under this heading that was carried on for some time last year in the pages of this magazine (vol. lv, pp. 64, 89, 90, 138, 165), the following note may not be without interest. Along a stretch of road in this town, which is bordered on one side by plantations of considerable extent and on the other by the gardens of houses, there are eight street lamps thus disposed, "E" representing the ordinary drawn wire-filament electric and "G" incandescent gas:

E G G G G E

On these winter moths are wont to congregate, and during the

first half of December last I took careful note of those that were attracted on such evenings as I was able to inspect the lamps, with the following results, the moths recorded being *Cheimatobia brumata* unless otherwise stated :

Dec.	Electric.	Gas.	Sky, etc.	Wind	Time.
1 .	2*	1, 1 .	Overcast, fair .	N.W., light .	10.0 p.m.
2 .	1, 1 .	3, 1 .		N., .. .	6.30 ..
3 .	1, 1, 3 .	1, 2, 1 .	.. drizzle .	N., .. .	7.0 ..
4 .	1, 1, 2, 4 .	3, 1 .	.. fair .	N., .. .	8.0 ..
7 .	<i>Nil</i> .	<i>Nil</i> .	.. chilly .	N., fresh .	10.0 ..
9 .	.. .	1, 1 .	Bull .	N., light .	6.30 ..
11 .	4*, 3 .	1, 2 .	Overcast, chilly .	Calm .	6.30 ..
12 .	<i>Nil</i> .	<i>Nil</i> .	Overcast .	N., light .	8.30 ..
15 .	.. .	1 .	Clear sky .	S.W., light .	8.0 ..
16 .	.. .	1, 1 .	.. .	S.W., moderate .	6.30 ..

Totals 24

22

* Including one *Hybernia defoliaria*.

It would therefore appear that there was in this case little difference in the attractive power of these two kinds of lamps.—ROBERT ADKIN; Eastbourne, January, 1923.

OVA OF BRITISH LEPIDOPTERA.—The attention of readers is called to Mr. Tonge's request (on another page) for ova of various species for photographing, and it is hoped that every assistance may be given him in his self-imposed task of making a complete micro-photographic record of this stage of the life-history of all our British Macro-Lepidoptera. Notes of the species particularly wanted will appear from time to time under "Exchange."—N. D. R.

RECENT LITERATURE.

A Natural History of British Butterflies. By F. W. FROHAWK F.E.S., M.B.O.U., etc.

As most British lepidopterists have very well known, Mr. Frohawk has been engaged on this work for a considerable time; but it comes as a surprise to learn that the actual period of preparation has occupied thirty-two years. Mr. Frohawk's name, both as an observer and as an artist, is in itself a sufficient guarantee of the excellence of the work, of which, so far, we have only seen the prospectus. But if the two volumes, when published, show the same high standard throughout the promised 1500 figures as is shown by the plate of *Vanessa io* enclosed with the prospectus, the only thing we could wish for is that Mr. Frohawk had not confined his attentions to the Rhopalocera alone. We are promised the complete life-history, fully illustrated, of every British species, also figures of the more unusual aberrations of the perfect insects. Although we have little sympathy with this latter subject, believing that the study of local and seasonal variation would be far more profitable to the science than the encouragement of the aberration hunter, yet there is no doubt it does appeal to the majority of collectors, and hence Mr. Frohawk will certainly be meeting a very

general demand in giving these figures. Originality is an outstanding feature of the book. Every one of the figures is entirely original; every observation on the stages of the life-histories of each of the sixty-eight species dealt with is due to the patience and energy of the author. The size of the work will be folio—15 × 10 inches; the text will run to 220 pages, and there will be sixty-four plates, all but four of which are to be in colours. Publication will be by the author, at the subscription price of six guineas—a high price certainly, but not disproportionate to the value of the work. We trust its production will meet with the success Mr. Frohawk so thoroughly deserves.

Proceedings of the South London Entomological and Natural History Society, 1921–22. Pp. 17 + 83. 1922.

THIS small, well-arranged and neatly printed volume of Proceedings bears ample witness to the activities and sound condition of the South London Entomological and Natural History Society during the 1921–22 session. A wide range of interest is evidenced by the variety of the exhibits at the meetings, amongst which one notes such diverse forms as lichens and Crustacea, scale-insects and birds, whilst many of the meetings were enlivened by lantern-slide illustrations. Some interesting captures were made during the field meetings, and the Annual Exhibition proved a great attraction. An account of *Rhyssa persuasoria* by Miss L. E. Cheeseman, abstracts of lectures by Mr. C. D. Soar on the British *Hydracarina*, and by Mr. L. W. Chubb on "Highways and Byways," go to make up a highly useful little publication, the value of which is greatly enhanced by Mr. K. G. Blair's Presidential Address on Will-o'-the-Wisp.

THE need of a precise analysis of the morphological manifestations which accompany the postembryonal development of insects, has induced Signor G. Grandi to undertake certain studies on the larval stages of various races of *Bombyx mori* L. The first of these studies appears in the *Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricoltura in Portici*, vol. xvi, and deals with the larval evolution of the white Japanese bivoltine race *Nipponnishiki*. Comprehensive tables are given, showing the variation of the hook-armature of the abdominal feet, the conclusions are carefully drawn up at the end of the paper, and a useful key for the determination of the various stages of the larva is appended. The paper is illustrated with many fine text-figures.

The Scottish Naturalist (July to October, 1922).

To Entomologists the following articles are of interest:

(1) On the Ischnocera (Bird Lice or Mallophaga) parasitic upon British Grouse. By J. WATERSTON, D.Sc.

(2) Some Insect Records from the Edinburgh District in 1921. By W. EVANS.

(3) Notes on the Poplar Saw-Fly (*Trichiocampus viminalis*, Fall.) By R. C. FISHER, B.Sc.

(4) Additions to the List of Clyde Coleoptera. (Third Series.) By A. FERGUSSON.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY.—*Wednesday, December 6th, 1922.*

The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair. *Obituary*: The President announced the death of Mr. H. J. Elwes, F.R.S., a former President, and a vote of condolence with his relatives was passed. *Nominations for 1923*: The Secretary again read the list of nominations of Officers and Council for the ensuing year, and said that he had not received any alternative names. *Election of Fellows*: The following were elected Fellows of the Society: Mr. Donald Allen, 21, All Saints' Road, King's Heath, Birmingham; Mr. H. L. Andrews, c/o John Heelas, Esq., Queen Anne's Mansions, London, S.W.—*Gifts to the Society*: The Treasurer called attention to two new portraits in the Meeting Room, and also exhibited the plans for a new Meeting Room, which it was proposed to erect at the back of the present building at some future date. These had been drawn up by Mr. W. Rait-Smith and presented to the Society, and a vote of thanks to him for his generosity in the matter was passed unanimously. *Exhibitions*: Mr. H. Donisthorpe exhibited the larva and pupa case of a species of *Microdon* associated with ants; Mr. W. G. Sheldon, a rare British Tortrix, *Hedya simplana* F. von R.; Dr. E. A. Cockayne, examples of homocosis in butterflies; Capt. K. J. Hayward, an aberrant example of *Limenitis sibilla* from the New Forest; Dr. H. Eltringham discussed the structure of the tympanic organ in Noctuid moths referred to by Dr. Jordan at the previous meeting; Dr. K. Jordan, F.R.S., exhibited some mimetic Castniidae and gave some account of a scent organ that is found in them; Mr. L. B. Prout, on behalf of Mr. J. J. Joicey, Geometrids of the Genus *Boreleta* Wlk., and gave some account of examples of sexual dimorphism and mimicry in these moths; Mr. H. J. Durrant, some rare and aberrant British Lepidoptera, including *Eucosma plebeiana* L., new to Britain; Dr. H. Eltringham, on behalf of Prof. Poulton, further examples of *Heodes phlaeas ethiopica* from S. W. Uganda, and some East African Lycaenids taken by Dr. van Someren, showing the attacks of lizards; Mr. W. J. Kaye, some remarkable groups of mimetic butterflies from Venezuela; Mr. W. J. Lucas made some remarks on the food preferences of *Vespa vulgaris* L.; Mr. L. W. Newman exhibited some varieties of British Lepidoptera; Mr. G. Talbot, on behalf of Mr. J. J. Joicey, some remarkable and little-known butterflies from the island of Buru, including a new *Ornithopteron*. Dr. H. Eltringham showed on the screen a drawing of the Nemopterid larva exhibited at the previous meeting; and Mr. Martin E. Mosely, who illustrated his remarks with lantern-slides, gave some account of a scent organ in New Zealand Trichoptera.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY. Annual Exhibition, November 23rd, 1922. —Mr. E. J. Bunnett, M.A., President, in the Chair. —Messrs. A. de B. Goodman and O. R. Goodman exhibited 83 species (out of 113) taken by them in the French Pyrenees (Orient.) in July, 1922, including *Papilio podalirius* race *jeisthamelus*, *Pieris*

manni, *Iacosopsis roboris*, *Apatura ilia* var. *clytie*, *Argynnis cydippe* ab. *cleodora*, and the form *chlorodippe* not previously recorded from French soil, *Parnassius apollo* ab. *brittingeri*, *Albulina orbitulus* race *oberthuri*, *A. pyrenaica*, *Erebia epiphron* race *pyrenaica*, *E. manto* race *caecilia*, *E. gorgone*, *E. melas* race *lesebvrei*, etc. Lord Rothschild exhibited a series of over 500 British *Arctia caja*, including many aberrations, together with larvae, pupae and parasites. He also exhibited for comparison a series of continental European typical specimens and aberrations and the various Asiatic and American geographical races of *A. caja*. He drew special attention to the Armenian and S. Caucasian race *wiskotti* Stdgr. as being dimorphic, the ♂ having white and the ♀ rose-coloured hind wings. The Japanese race was distinguished by its large size and heavy marking, while most of the American races have red tegulae (patagia): Mr. W. G. Sheldon, a series of about 700 *Sarrothripus recayana*, with all the named forms except ab. *sagittata*: Mr. E. E. Green, a small collection of miscellaneous Arthropods from Ceylon, including a large hunting spider (*Poecilotherie*), a "Cobra" Mantis, a "Lantern Fly," the "Caricature Bug," *Catacanthus*, etc., and bred series of *Pyrameis cardui* and *Euvanessa antiopa*, the latter from Gavarnie: Mr. H. A. Leeds, many aberrations of British Rhopalocera captured in 1922, including *Melanargia galatea*, with golden-tawny borders of all wings and forms comparable to ab. *procida*, ab. *caeca* of *Aphantopus hyperantus*, ab. *ptorsas* of *Strymon pruni*, extra spotted *Epinephele jurtina*, *Argynnis aglaia* and *Coenonympha pamphilus* with greatly increased area of wings melanic, numerous named forms of *Plebeius aegon*, many combination-named aberrations of *Agriades coridon* named from Tutt's Brit. Lepidoptera, and many others: Rev. G. Wheeler, the type specimens of *Loweia subalpina* var. *brunnea*, *Nomiades semiargus* ab. *striata*, *Albulina pheretes* ab. *caeruleopunctata*, etc., very fine striated forms of *Glaucopsyche cyllarus*, *Polyommatus icarus*, *Heodes virgaureae* var. *zermattensis*, *Loweia alciphron* var. *gordius*, also fine series of *Parnassius apollo* ab. *rufa*, *Apatura iris* ab. *iole*, *A. ilia* var. *clytie* and ab. *eos*, etc., with many other species showing obsolescence or excess of spotting: Miss L. Cheesman, a Japanese Long-horned Grasshopper, *Diastrammena marmorata*, a pest in greenhouses with orchids: Dr. G. S. Robertson, 2nd, 3rd, and 4th generations of *Catocala fraxini* from Horsham: the 4th gen. specimen was very pale, the 2nd gen. specimen very dark: Mr. H. B. Williams, the series of *Euchloë cardamines* with its named forms described in Trans. Lond. N. H. Soc., 1915, with many minor aberrations: Mr. R. Adkin, his series of *Diacrisia mendica* with all the named forms, including the new race *venosa* and the new mongrel *mistura* race, with a series of *Herse convulvuli* taken in his garden at Eastbourne: Mr. L. T. Ford, a short series of *Peronea cristana* from the Isle of Wight, including an ab. *purdeyana* form hitherto only taken at Folkestone: Mr. Hy. J. Turner, two old entomological works, Moufet's Insectorum sive Minimorum Animalium Theatrum, London, 1634, and Ulysses Aldrovandus' De Animalibus Insectis libri septem (1602), 1638: Mr. A. A. W. Buckstone, a striated (under) *Brenthis euphrosyne*, Kent, a dull brown *Vanessa io*, bred Lancashire, a melanic *Tephrosia consonaria*, Maidstone, extreme

light- and dark-banded *Crocallis elinguaris*, Wimbledon, etc.; Prof. Bateson, forms of the leaf in *Primula sinensis* represented as resulting from the combinations of three pairs of factors, any of which may be present or absent; Mr. A. W. Mera, a series of *Psilura monacha* bred from 1918 parents in successive years, the tendency to melanism being fully maintained to the last; on behalf of Mr. Copeland, Mr. Mera exhibited some fine examples of *Catocala nupta* with smoky hind wings, taken at Loughton in September, 1918; Mr. W. J. Kaye, a pair of the hybrid Sphingid *Luciani*, Denso., a cross between *Pergea porcellus* ♀ and *P. elenor* ♂; Mr. W. Brocklehurst, a gynandromorph of *Dryas paphia*, New Forest, 1922, and *Notodonta trilophus*, Bedford, light, May, 1907; Mr. W. G. Nash, a gynandromorph of *D. paphia* and var. *valesina*, New Forest, 1922, a nearly black ♂ of *A. coridon*, Royston, var. *plumbescens* and a gynandromorph of the same species, etc.; Rev. T. E. Tarbat, *Xylophasia monoglypha* from six localities, including an intensely black specimen from Mucking and a very pale form from Freshwater, also *Dysstroma truncata* from the latter place, one dark banded, another with much grey suffusion; Mr. L. W. Newman, his 1922 captures of *Agriades thetis* with extreme aberration in colour and marking, with 1921 series to show the contrast between the hot and cold season coloration, compared series of *Melitaea aurinia* from many localities, living pupae and imagines of *Colias croceus* from September laid ova, and many other notable aberrations; Mr. R. T. Bowman, varied series of *Polia chi* and var. *olivacea* and examples of *Numeria pulveraria* showing aberrant coloration; Dr. E. A. Cockayne, on behalf of Mr. Arthur Dicksee, (1) Homoeosis in *Papilio horishanus*, Formosa, (2) an aberration of ♂ *P. taiwanus* with an angulated hind wing instead of rounded, (3) a series of *Agrias amydon* showing stages in the development of a blue mark on the hind wing; Mr. L. F. Hammond, an *Epinephele jurtina* of a pale silvery grey, and an *Aricia medon* with the white coloration replaced by dull grey and lead colour; Col. R. H. Ratray, aberrations of British *Lycaenidae*, *Agriades thetis* ♂ with light grey patches, ♂ with dark leaden-coloured bar across wings, *Plebeius aegon* with similar patches, asymmetrically marked ♀ of the same species, *Adopaea flava* with glistening white patches, *Zygæna filipendulae* with confluent spots on right fore wing, and *Ilipocrita jacobaeae* with the red costal streaked united with the two outer marginal red spots; Mr. B. H. Crabtree, aberrations of *Argynnis aglaia*, black markings replaced by silver, and another with fore wings black shot with dark green and only a few fulvous spots, a third with extensive coalition of silver on the under side, and upper side nearly spotless, with series of aberrations of *A. thetis* and *A. coridon*; Mr. B. W. Adkin, a small suffused *A. aglaia*, *A. cydippe* with enlarged markings, *Vanessa io* specimens with very variable borders to fore wings; Mr. H. Findon, a large collection of Australasian Mollusca, and pointed out several species the living representatives of extinct genera; Mr. C. H. Williams, aberrations of *A. grossulariata* and *A. coridon*; Mr. G. H. Cornish, on behalf of Mr. Juby, a *Rumicia phlaeas* with the red marginal band represented by red dots; Mr. A. E. Tonge, *R. phlaeas* ab. *schmidtii*, bleached forms of *Epinephele jurtina*, striated and obsolete forms of *A. coridon* and *A. thetis*, etc.;

Mr. D. H. Pearson, *Polyommatus icarus* from Notts, 1922, a fine gynandromorph, left side ♂, right side ♀, various very blue ♀s, some with well-marked lunules, and a large number of varied forms of *Rhopalocera* taken in the Eastern Pyrenees, and a drawer of *Mel. didyma*, referring especially to the very remarkably dark variegated Gavarnie females; Mr. W. F. H. Rosenberg, rare Lepidoptera from S. America, *Papilio euterpinus*, *Pereute beryllina*, the Saturniidae *Copiopteryx southonaraxi*, *C. derceta*, *Loxolomia serpentina*, the last having strong sexual dimorphism in the form of the hind wings; Mr. T. W. Enefer, a bird's nest which had been placed in the petrifying springs of Matlock.—HY. J. TURNER, *Hon. Editor of Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The Opening Meeting of the Session was held on *October 16th*, and was devoted to exhibits. General reports from members pointed to the fact that it had not been a very good season for collecting. One of the most interesting features was the wide distribution and abundance of *Colias edusa*; practically every member present had captured at least one specimen, and several reported having taken fairly good series. In our immediate neighbourhood it was reported from Hale, Formby, Chester, Tattenhall, Waverton, Mouldsworth, Point of Ayr, and Abergele. Var. *helice* was taken at Abergele and Chester. Mr. B. H. Crabtree, F.E.S., exhibited a small box of varieties of *Chrysophanus phloeas*, including var. *schmidtii*; Mr. S. B. Doudney, a good exhibit of Witherslack insects, including *Xylocampa areola*, *Dasychira pudibunda*, *Pterostoma palpina*, *Abrostola triplasia*, *Drepana lucertmaria*, *Nemoria viridata*, *Scodionia fagaria*, *Acronycta menyanthidis*, *Ino geryon* and *Coenonympha typhon*, and from Budé *Nomiades arion*; Mr. Garner Richards, a long series of *Lycena icarus*, and *Chrysophanus phloeas* from Hale district (Lanes); Mr. A. W. Hughes, *Eupithecia consignata* from Warmington, Northants, and a series of a light form of the female of *Pararge egeria*, and a bred series of *Malacosoma neustria*, and some *Aromia moschata* (Col.) from Freshfield; Mr. C. F. Johnson, F.E.S., series of *Lycaena corydon* and *Lycaena bellargus*, including some beautiful varieties; Mr. Wm. Mansbridge, some fine series of *Blastobasis lignea* and its dark variety *adustella*, and also a pale variety from Grange; Mr. C. P. Rimmer, a series of *Abraxas grossulariata* with some dark forms from Neston, Cheshire, and one very pale form from Abergele, N.W.; Mr. S. Gordon Smith, F.L.S., F.E.S., a fine collection of varieties secured this year, including the following: From Chester—*Pernoptilota fluviala*—a bred series obtained from specimen which came to light. *Agrotis puta*—series taken at light. *Dianthoecia carpophaga*—dark var. taken at light; *Agrotis exclamationis*—varied series at light; *Luperina testacea*—dark var. at light. From Delamere: *Anisopteryx aescularia*—var. with almost unicolorous fore wings at light; *Diacrisia sanio*—three, including one var. with the band on the hind wings missing; *Spilosoma lubricipeda*—var. approaching var. *fasciata*; *Polyploca flavicornis*—2 vars. without the cross lines, one var. with the cross lines

joined together; one var. with thorax and body black: one var. very pale. A specimen of *Drepana binaria*, taken at Mouldsworth: *Chrysophanus phlaeas*, var. with the orange-red band of hind wings missing, from Waverton. From Witherslack: *Mamestra dentina*, dark var. *Rusina tenebrosa*—very dark specimen. Series of *Pachys betularia*, *Lomaspilis marginata*—varied series taken at light. From the New Forest: 2 females of *Lymantria monacha*, one being a var. with whitish instead of pink body. *Asphalia diluta*, varied series. A var. of *Noctua c-nigrum*, with the costal mark pinkish brown. A specimen of *Agrotis cinerea*, taken at Parc Llwydiarth. A specimen of *Lithophane socia*, taken at Dolgelly, and *Selenia bilunaria*, dark form from Dolgelly. A var. of *Arctia caia* from a Formby larva, and a var. of *Agrotis strigula* from Moel Famman; Mr. Robert Tait, F.E.S., *Carterocephalus palaemon*, *Nemobius lucina*, *Ematurga atomaria* from Northants. *Limenitis sibylla*, *Argynnis adippe*, *Hemaris bombyliiformis*, *Triphaena subseque* = *orbona*, *Dipterygia pinastri*, *Aplecta herbida*, and *nebulosa*, including a var. with dark band on the upper wings: *Phorodesma bajularia*, *Ephyra trilinearia*, *Limacodes testudo*, etc., from the New Forest. Also a fine series of *Boarmia repandata*, bred from Penmaenmawr larvae.—C. P. RIMMER, *Hon. Sec.*

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held in the Manchester Museum, Victoria University, on Wednesday, December 6th, 1922, Mr. H. Britten, F.E.S., presiding. The subject was the family Zygaenidae, and many members brought exhibits of this family. Mr. H. Crabtree, F.E.S., gave an account of the life-history and distribution of this interesting family, and exhibited a drawer containing all the British Zygaenidae, including some fine varieties of *Z. filipendulae* (yellow, pink and black), *Z. lonicera* and *Z. trifolii*, also a few nice *Z. achilleae* from Oban; Mr. W. Buckley, *Z. filipendulae* bred from Lanes coast cocoons, and some interesting notes on collecting *Z. minos* at Abersoch, where he was fortunate enough to take a black form; Mr. R. Tait, F.E.S., a drawer containing all the British Zygaenidae with some very nice forms; Mr. C. F. Johnson, F.E.S., a box of Continental Zygaenidae showing some very beautiful forms; Mr. H. Britten, F.E.S., a drawer of Zygaenidae, from the Sidebottom collection, containing some fine varieties of *Z. filipendulae*, *Z. trifolii*, and *Z. lonicera*, also young larvae of *Mania typica* on Rhododendron leaves: Mr. L. Nathan, *I. statice* and *Z. filipendulae* from Aberdovey 1922, live ♀ *C. croceus* bred December 6th from ova; Mr. C. H. Frost, *P. populi* and *H. pemmaria* taken at light at Alderley Edge, November 13th, 1922; Mr. J. H. Watson, F.E.S., *Philosamia ricini* and cocoons, also living larvae of some species on privet. He explained that it was very difficult to get this valuable silk moth of Bengal and Assam to this country alive owing to its extremely short pupal period, and only on three occasions in thirty years had it been possible.—J. F. G. WYNNE, *Hon. Sec.*

WE regret to have to record the death of the well-known Tasmanian Entomologist, Mr. F. M. LITTLER.

THE ENTOMOLOGIST.

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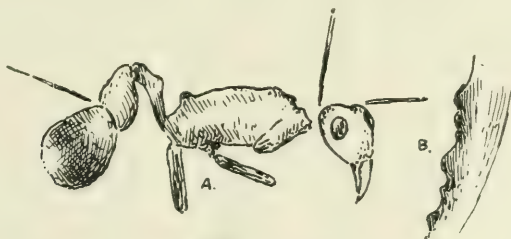
MARCH, 1923.

[No. 718

THE EARLIEST KNOWN PONERINE ANT.

BY T. D. A. COCKERELL.

THE earliest known ants are from the Green River Eocene of the Rocky Mountain region. From this formation in Colorado I recently published (1921) a new genus *Eoformica*, belonging to the Formicinae (or Formicidae proper), apparently more or less related to the modern *Oecophylla*. Scudder had previously indicated species supposed to belong to the existing genera *Myrmica*, *Liomotopum*, *Lasius* and *Camponotus*, but these generic assignments are subject to revision. Among all these there is no evidence of



Archimyrmex rostratus, Ckll. A. Magnified 4 diameters. B. Cutting edge of mandible.

the Poneridae (or Ponerinae), which are supposed to be the most primitive of living ants. These animals, as we know them to-day, are comparatively rare and retiring, usually with small colonies. It is therefore to be expected that they will be uncommon among the fossils, though they have been found, *e. g.* in amber and at Gurnet Bay. Among the Poneridae, the Myrmecii or Myrmeciinae (not Myrmicinae), the bull-dog ants of Australia, stand apart as a distinct group, considered by Emery and Wheeler to be the most generalised of all known ants. In Baltic amber is a genus of these insects, *Prionomyrmex* Mayr, which Wheeler finds to be still more primitive than *Myrmecia*, and therefore the archetype of all known Formicoidea.

I now have to record another genus, allied to *Myrmecia* and *Prionomyrmex*, from the Green River Eocene of Colorado. It was found last July by Mrs. Cockerell at our Station 1, which is on a spur of the Roan Mountains, at the top of the Ute trail. The

characters cannot be seen as well as in the amber species, but they are sufficient to indicate a distinct type.

Archimyrmex new genus.

Rather large, elongated ants, with a general resemblance to *Myrmecia*, but with the eyes (as in *Prionomyrmex*) high up on the side of the head; the epinotum with a distinct elevation (presumably pair of elevations), placed as in *Ectatomma tuberculatum*, but large and obtuse; mandibles less elongated, but still long, the cutting edge with coarse obtuse teeth, between which are smaller ones; femora apparently shorter than in *Myrmecia*; first joint of pedicel elongated, with a dorsal elevation beyond the middle, the joint less massive than in the other two genera, but similar in principle to that of *Myrmecia rinder* Smith; second joint large and robust (its position reversed in the specimen), quite like that of *Myrmecia*, as also is the gaster. The mandibles of *Prionomyrmex* have a reniform denticulation, so those of our insect more resemble *Myrmecia*, which has irregular but much more prominent teeth.

Archimyrmex is therefore intermediate in some respects between *Myrmecia* and *Prionomyrmex*, but on account of the position of the eyes should apparently fall in Wheeler's tribe *Prionomyrmecini*.

***Archimyrmex rostratus* n. sp.**

Worker.—Colour as preserved brown, the upper part of head and the gaster blackened, the coloration perhaps originally similar to that of *Myrmecia rinder* var. *nigriceps* Mayr. Length nearly 16 mm.; head with mandibles about 4 mm.; thorax about 5.3 mm.; middle femur about 3.7 mm. The specific name is derived from the beak-like effect produced by the mandibles.

SPRING LEPIDOPTERA IN SOUTH AND CENTRAL
SPAIN.

BY ALBERT F. ROSA, M.D., F.E.S.

PERHAPS rather late in the day I am penning a few notes on a short trip to Andalusia in the spring of 1921, though I am bound to say the species met with, as will be seen, include nothing new; still it is a few years since any records have been given of the localities visited.

A month seems to be a long time when you are looking forward, but when you deduct the *ida y vuelta* and journeys from one place to another, which apparently always occupy the better part of a day in the South of Spain, there is very little time left for actual work, not to speak of days when none can be done through inclement

weather, which is a decided factor as it applies in the south of the Iberian Peninsula.

Travelling overland *viâ* Irun-Hendaye and Madrid, I arrived at Granada, Andalusia, on the evening of the 18th May, and put up at the Hotel Washington Irving. The next morning I went up the road behind the Alhambra leading past the Generaliff to the ridge overlooking the Rio Darro and collected on the plateau and on the Sella del Moro. The ground here seems to be to-day much more cultivated and grazed than I had been led to believe by accounts of previous visitors, and there is a steady stream of single individuals or of small parties with their burros, engaged in carrying loads of firewood or fodder into Granada by the mountain path, and not uncommonly one would stop and point out something such as a *Papilio machaon* settled amongst the heath, already noted as being not worth netting. The principal species taken on the crest were *Euchloë tages*, *E. belia* and its var. *ausonia*. *Scolitantides baton* var. *panoptes* HB. was common and fresh out, and so also was *Melanargia ines*, the latter chiefly on the Sella del Moro. *Colias croceus* was about in small numbers, and I obtained a nice specimen of the var. *helice*. The next morning I took the road past the cemetery, leading down the slopes to the Genil, and in the little ravines got a fine series of *Melitaea dione* var. *navadensis*, including some of the large females. Saturday, the next day, was wet; the two days following were very cold and very sunless; on the 24th it was warm, or, I should say, hot, and finished with a thunderstorm. The 25th was fine, and I had the pleasure of taking my first *Zegris eupheme* var. *meridionalis*—a female in beautiful condition. I also took *Lampides boeticus* and *Tarucus telicanus*. *C. croceus* was common and quite fresh and I again got one or two of the var. *helice*.

The next two days were poor, and on Saturday the 28th, rather tired with the bad weather, I journeyed to Ronda and put up at the Hotel Reina Victoria, which I found very fine—and expensive. My first day here I secured a long fresh series of *Euchloë belemia* and its var. *glauce*—I suppose a second brood*—and the same of *E. belia* var. *ausonia*. *Melanargia ines* was also very common and fresh.

On the 31st I returned to Granada and collected there for another two days, during which period I took a few *Iphiclides podalirius* var. *feisthamelii* amongst other things. I was much interested in the birds of the district, especially in the Griffon

* This is very remarkable. *E. belemia* is one of the earliest species to emerge in the spring, occurring at low levels in southern Spain in February and March. At Ronda, with its elevation of over 2000 feet, it is, of course, later, but on April 19th, 1908, the typical form was just going over, and the second generation, var. *glauce*, was well out there (see Ent., xli, p. 214). I suppose Dr. Rosa is quite certain that some of his captures were of the type form, and not all var. *glauce*, which varies considerably.—W. G. S.

vulture, *Gyps fulvus*, of which I saw at Ronda eight at one time, soaring on motionless pinions, and during my absence from Granada there had been a banquet which I am sorry I had missed seeing. Coming up from the Genil I almost stumbled into the remains of the carcase of a mule which I had previously noticed standing about on the hillside, and which had apparently died and formed the *piece de resistance* of the vultures.

Returning to Madrid I went on, two hours' journey, to El Escorial. I was attracted to this locality by a description given by a gentleman from Gibraltar. The place, which is principally visited by tourists on account of its historical palace and monastery, De San Lorenzo, and the paintings therein, which I believe are very valuable, is stated to be subject to severe hailstorms at certain times, the stones being very large: I should not care to mention the size I was told.

The village is situated on the south-east slope of the mountain, backed up by forest, and is divided into an upper and a lower portion, Escorial de arriba, where the palace is situated, and Escorial de abajo, near the station, or "upstairs" and "downstairs" as the natives say. I took a room at the Hotel Mirenda y Suizo, opposite the palace. The road leads up to the mountain, Cerro de los Avantos, a spur of the Guadarrama, at the back of the village. The locality I found during my stay there of two days—not very bright ones—a very good collecting-ground, though I did little more than sample it during the short period I was there. The road winds upwards beside a rocky ravine, through which a brook wends its way downwards towards the village, which it supplies with pure water, much appreciated after one's visit to the south, where the only drinking-water had to be purchased at 2 pesetas a quart, while wine cost only one and a half.

The undergrowth on this rocky hillside is principally *Dipsacus*, *Carduus*, *Thymus*, *Pteris*—a plant resembling *Azalea* in habit with conspicuous white, single flowers—*Cytisus*, and at some parts reedy: the trees *Populus*, *Salix* and somewhat stunted two-needle pines, probably the Corsican variety, which latter extend upwards to the tree limit, although I never ascended to that height, there being so much to do lower down. The mountain rises to an altitude of 5740 feet, 2000 above the upper village, this on a foundation of granite, alluvial at parts.

Here I took fresh typical *Thais rumina* and its var. *medicicaste* or intermediates, *Melitaea didyma* var. *neera*, *Dryas pandora*, *Scolitantides baton* var. *panoptes*, *Nomiades cyllarus*, *N. melanops*, *Euchloë belia* and *Colias croceus* var. *helice* amongst others. I left Escorial on the 4th June, and below give the full list of Lepidoptera seen and taken:

Iphiclides podalirius var. *feisthamelii*.—Several taken on the ridge overlooking the Darro at Granada. Compared with specimens

taken at Le Vernet, Pyrénées orientales in June, 1912, there is a close resemblance, but the latter have no pale longitudinal line dividing the black band on the inner margin hind wing. The Vernet specimens are therefore var. *miegii*.

Papilio machaon.—Common at the same spot as the last. Also taken at Ronda in the pine wood at the other side of the Cirque or basin (locally known as the vega).

Thais rumina.—In fair condition, but not common, above the village at Escorial. I think some are referable to var. *medicicaste*.

Aporia crataegi.—Just coming out at Granada on the day I left, when I took a very large male, and I found it emerging in abundance and of large size at Escorial. The form with the black wedges along the margin was not uncommon (*suffusa* Tutt).

Pieris brassicae and *P. rapae*.—Granada, the latter common but no females; also common at Escorial. I netted all those seen with the object of finding *P. manni*, which I took freely at Vernet in 1912.

Pontia daplidice.—In all localities visited.

Euchloë belia.—One at Granada. Var. *ausonia* very common at Ronda, but many range between the var. and the type, having speckled anterior border and doubtfully characteristic underside hind wing.

E. belemia.—Very common at Ronda at the edge of the cliff, and, like the last, in splendid condition. Also var. *glauce* and others tending towards it.

E. tages.—Rare on the ridge at Granada; hind wings very pale below.

Anthocharis euphenoides.—The specimens taken at Granada were very small and had rather dark tips in the female. They were rather common at Escorial and of larger size.

Zegris eupheme var. *meridionalis*.—Scarce, only one good female.

Gonepteryx cleopatra.—Granada, not common.

Colias croceus.—Every locality; especially common at Granada, where they had very black tips and borders. Var. *helice*, Granada and Escorial.

Melitaea dione var. *navadensis*.—Granada; many good, but some were worn. Of large size, and compared with specimens of the species from Le Vernet (1912) more strongly marked, larger, and banded.

M. phoebe var. *occitanica*.—Some very beautiful examples, and of large size, especially the females. Granada and Escorial.

M. didyma var. *neera*.—One fine specimen at Escorial, a ♂, paler and less marked with black than any I have yet taken, and seems to resemble the description of this Eastern variety.*

* I have a specimen of *Satyrus fatua*, another eastern form, taken along with *S. statilinus* and *S. fidia* at Albarracin in 1906. Staudinger gives "*fatua* var. *sylvecola* Maur. subf. fere unicolor, griseis," which description suits this specimen.

Issoria lathonia.—El Escorial, common.

Argynnis niobe.—Escorial.

Dryas pandora.—El Escorial; just coming out like the last-named; males only. Also seen at Ronda.

Pyrameis cardui.—Common and worn at Granada, also occasionally at Ronda.

P. atalanta.—El Escorial. I did not capture this, but the last time I saw it I thought I observed a red ring on the fore wing as in *callirhoe*.

Melanargia ines.—Very common at Granada and Ronda and in excellent condition. Varies greatly in size, some very small.

Hipparchia semele.—Granada.

Pararge megera.—Granada. Frequent also at Ronda.

Epinephele ida.—Same localities as the last.

E. pasiphae.—At the same places.

E. jurtina var. *hispulla*.—Very large at Granada and a far finer form than I have from the South of France or Corsica, especially the females. Males are darker and females more squarely decorated with light brown. These correspond with the figures of *fortunata* in Seitz' work.

Coenonympha pamphilus.—Escorial and Granada.

Thecla spini.—Ronda; one specimen fresh out at the other side of the Cirque.

Th. aesculi.—One, also in excellent condition at the same place.

Callophrys rubi.—All three localities (var. *fervida*), worn.

Heodes phlaeas.—Males tend to var. *eleus*, but the females do not.

H. gordius var. *granadensis* Ribbe. One of each sex, both chipped but fresh out; Escorial. These have larger black spots and yellower undersides.

Lampides boeticus.—Granada, in fields of peas, not uncommon, but difficult to get perfect.

Tarucus telicanus.—Granada, not common.

Scolitantides baton var. *panoptis*.—Granada, fresh and common, May 19th. Ronda scarce, and also at Escorial.

Aricia medon (*astrarche*).—Granada, on the ridge.

Cupido minimus.—Escorial, two ♀♀. I presume it would be difficult to distinguish between the female of *lorquinii* and that of *minimus*.

Nomiades cyllarus.—Escorial.

N. melanops.—I think one specimen corresponds with this species; it is of large size and a darker colour than the last, and darker grey underneath.

Polyommatus icarus.—Granada, not common.

Agriades thetis.—One female at Granada with very distinct marginal ocelli.

Carcharodus altheae var. *boeticus*.—Granada.

Pyrgus proto.—Granada, not infrequent. Unfortunately I saw neither *P. sao* var. *enerata* nor *Nisoniades tages* var. *cervantes*.

Of day-flying moths, which were very common at Escorial, I collected a few, and find they represent the following species: *Heliothea discoidaria*, *Fidonia pennigeraria* and *Euclidia gonospileia*. Some small larvae collected at Granada produced a plume, but I have not had the species identified.

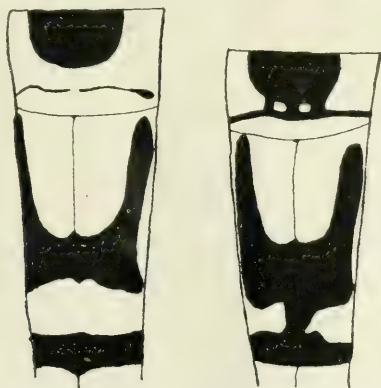
28, Pitt Street,
Edinburgh.

ABNORMAL MARKINGS OF *AGRION PUELLA* LINN.

BY RAYMOND V. WADSWORTH.

DURING the year 1922 two male *A. puella* Linn., were taken showing abnormal markings on the first and second abdominal segments. The specimens were obtained in June over a pool near Hopwood in the county of Worcester.

The first specimen showed on the first abdominal segment,



Abnormal markings on first and second abdominal segments of *Agrion puella*.

besides the usual somewhat semicircular black spot, an incomplete uneven black line about half-way between the spot and the end of the segment. On the second segment the U-shaped black spot was nearly normal, but the black band behind it was unusually broad.

The second specimen showed a further stage in the variation, and seemed about half-way, in the markings of these two segments, to *A. pulchellum* Lind. The first abdominal segment had the black line complete and much thicker than in the first specimen, and joined to the black semicircular spot by three thick lines.

In the second segment the base of the U-shaped black spot was much thickened, and this was joined to the black band below by a broad black line of irregular outline.

In other respects than the above markings the specimens were practically normal *A. puella* Linn. No specimens of *A. pulchellum* Lind. were found over the pool or in the neighbourhood. The only other Agrioninae present were *Ischnura elegans* Lind. and *Enallagma cyathigerum* Charp., the former being the predominant species.

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ENTOMOLOGY IN THE HOLY LAND.

BY CAPT. P. J. BARRAUD, F.Z.S., F.E.S.

(Concluded from p. 41.)

Pseudopanthera syriacata, Guen., a pretty little day-flying "speckled yellow," occurred at Nazareth in March and April, from 1500 to 2000 ft. above sea, and at Jerusalem, 2500 ft., in April. Another day-flying species, of which some beautiful examples were caught, was *Lithostegia farinata*, Hufn., Jenin, 700 ft., in March, and Nazareth in March and April. Captures at light at Haifa in April included: *Ptychopoda filicata*, Hb., *P. incarnaria*, H.-Sch., *Eupithecia unedonata*, Mab., *Anaitis mandulata*, ab. *submandulata*, Stgr., *Gnophos palaestiniensis*, Calb. ("only known from Palestine"), and *Xenochlorodes olympiaria*, H.-Sch.

The month of May and the first half of June proved to be the best period; after that the hot season obtains full sway, the country becomes arid, and very little can be found. Several more species of *Ptychopoda* came to light at Haifa: *P. circuitaria*, Hb., *P. fractilineata*, Zell., *P. incarnaria*, H.-Sch. ab. *ruficostata*, Zell., "as the costa of this example is hardly red it ought perhaps to be separated as ab. *grisea*, Th.-Mieg." *P. obsoletaria*, Rbr., *P. consecrata*, Stgr., "confined to Palestine," at light, and flying amongst herbage; *P. rufaria* and *P. consanguinaria*, Led.!, flying in a meadow; *P. intermedia*, Stgr., and *P. longaria*, Rbr., "a nice aberration with the dark shades very heavy." Other genera were represented by *Hierochthonia pulverata*, Warr., May and June, "only known from Syria"; *Gnophos sartata*, Tr., Mount Carmel, at rest on a rock, 10.v.20; *Rhodostrophia calabra*, var. *tabidaria*, Zell., Nazareth, "large, with outer band rather narrow, and the cell-spots enlarged—perhaps a local tendency"; *Gnophos poggearia*, Led., several at light, "a local species confined to Syria and the Taurus Mountains"; *Acidalia marginepunctata*, Goeze, and *A.*

turidata, Zell., at light; *Problepsis ocellata*, Friv.; *Cosymbia pupillaria*, Hb., and *Microloxia herbaria* var. *advolata*, Ev., at light; *Rhodometra anthophilaria*, Hb., "belongs to the *sacraria*-like form, which passes as ab. *subsacraria*, Stgr. (hind wing white, unmarked), and which seems to be the principal form in Algeria. My only other example from the Palaearctic region (Jerusalem) is also referable here, but the synonymy of the species is still in some confusion, and I rather suspect we have two or three close allies passing as one."

MICRO-LEPIDOPTERA.

In addition to the two new species already mentioned (vol. liii, p. 227), seven others, which have been named by Mr. Edward Meyrick, were discovered. They are—**Pterophoridae**: *Agdistis excurata*, Haifa, at light, 23 . v . 20. **Oecophoridae**: *Depressaria remota*, Haifa, 21 . i . 20; *D. amblyopa*, Haifa, 9 . i . 20; *D. liodryas* Nazareth, April, 1920; *D. chlorothorax*, Nazareth, 15 . ii . 20; *Nochelodes xenicopa*, Nazareth, April, 1920. **Tortricidae**: *Cnephasia tofina*, Nazareth, April, 1920. Most of the above have been described by Mr. Meyrick in *Exotic Micro-lepidoptera*, vol. ii, parts 12 and 13.

Other captures coming under this heading were: *Platiptilia acanthodactyla*, Hüb., Haifa, 28 . i . 20; *Oxyptilus marginellus*, Zell., Haifa, 20 . v . 20, both at light; *O. parvidactylus*, Haw., Haifa, 14 . vi . 20; *Agdistis tamaricis*, Zell., Haifa, 14 and 21 . vi . 20; *Sphenarches caffer*, Zell., Haifa, 21 . vi . 20; *Alucita indocta*, Meyr., Haifa, 30 . v . 20; *Trichoptilus xerodes*, Meyr., Haifa, 25 . vii . 20; *Depressaria ? chaerophylli*, Zell., Nazareth, 15 . ii . 20; *D. xyleuta*, Meyr., Haifa, 18 . v . 20; *Tortrix imperfectana*, Led., and *Cnephasia longana*, Haw., Nazareth, April, 1920; *C. tristrami*, Wals., Haifa, 27 . v . 20; *Platyedra vilella*, Zell., Nazareth, 16 . ii . 20; *Symmoca vitiosella*, Zell., Haifa, 25 . v . 20; *Apiletria nervosa*, Staint., and *Euxanthia aureopunctana*, Rag., Haifa, 27 . v . 20; *Scythris desidella*, Led., Haifa, 29 . vi . 19.

ODONATA.

In the larger marshes of the maritime plain of Palestine, dragonflies are to be found during most of the year, and in spring and early summer, when the wet season gives place to the hot weather, they often occur in swarms over the reedy pools and shallow swamps. The Jordan Valley also affords some good collecting-grounds, but, owing to somewhat frequent raids by bands of marauding Arabs from the east, the district was at times none too safe. My collecting was intermittent, being confined to spare afternoons, or sometimes combined with the work of hunting for mosquito larvae.

Of the **Libellulidae**, *Orthetrum anceps*, Schneider, is common

in Northern Palestine, throughout the summer. In certain of its characters it is subject to a considerable amount of variation. Mr. Herbert Campion, who has very kindly examined a number of specimens of this and other species, has forwarded the following note: "The male genitalia of the series included under the name *Orthetrum anceps* are very variable in form, and in certain cases it is extremely difficult to decide whether a particular specimen should be referred to that species or to *O. chrysostigma*. The single male definitely called *O. chrysostigma* is remarkable for the extreme pruinosity of its body, making it look more like *O. brunneum*, but the structure of the genitalia leaves little room for doubt as to what it is." The single male referred to was taken together with males of *O. anceps* on the road between Tiberias and Tabgha (near Capernaum) on the 30th July, 1920. The other specimens of *O. anceps* were captured in the Kishon marshes in June and July, 1920; at Jenin in August; and at El Afule, near Nazareth, in July of the previous year. Only a few specimens of *O. brunneum*, Fonsc., were captured; Kishon marshes 23 . vi . 20, and Ras el Ain, at the source of the Auja river, 22 . viii . 20. *O. sabina*, Drury, was found commonly in the Kishon marshes, and at Athlit, from May to August, 1920; and *Crocothemis erythraea*, Brullé, in the same localities, as well as at Ras el Ain, and Tabgha.

Sympetrum meridionale, Selys, in teneral condition, was seen in extraordinary numbers in the Kishon marshes in May, and was also taken near Nazareth. *S. fonscolombei*, Selys, was represented by a single male from Athlit, 24 . vii . 20. This was flying on the sands close to the sea, and gave me a long chase. One or two more were seen, but escaped capture. *Trithemis annulata*, P. de B., has a wide distribution, from Sarona, near Jaffa, to the Upper Jordan, and is on the wing from May to September. The pretty little *Brachythemis leucosticta*, Burm., with banded wings, is also to be found fairly commonly in central and northern Palestine at low elevations, and was taken in June and July. A single male of the rare *Libellula pontica*, Selys, was secured on 16th May, 1920, in the Kishon plain.

The **Aeschnidae**, from their habit of gliding to and fro over the larger ponds, and their almost uncanny powers of eluding the net when they do happen to come within reach, were not often taken, although sometimes numbers could be seen. After some hard work, and more than one wetting, three species were added to the list: *Anax imperator*, Leach, in May; *Aeschna mixta*, Latr., in June; and *Anax parthenope*, Selys, in August, all in the Kishon marshes. The last-named was seen on several occasions flying after sunset, and even when it was almost dark.

Two species of **Agrionidae** were found fairly commonly, viz. *Ischnura elegans*, Lind., at Sarona, Athlit, and Haifa, in June, July

and August, and *Platycnemis latipes dealbata*, Selys, at Haifa and Tiberias in July and August.

At Jisr el Damie, 1000 feet below sea-level, on 31st March, 1920, two species of **Calopterygidae**, *Epallage fatime*, Charp., and *Calopteryx splendens syriaca*, Ramb., were taken whilst flitting over a rapidly flowing tributary of the Jordan.

Of the **Lestidae**, three species were fairly plentiful, namely, *Lestes macrostigma*, Eversm., Kishon marshes in May; *L. virens* Charp., in the same place, and at Acre in July; *L. barbarus*, Fabr., Haifa, Acre, and Jenin, in May, July and August.

HYMENOPTERA.

I was unable to devote much attention to this Order, and my notes are little more than a list of names and dates. As, however, practically no collecting has been done in the country previously, even this may be of interest. The identifications have kindly been supplied by Rev. F. D. Morice through Dr. Marshall.

The sandhills and flats of the Kishon plain, between Haifa and Acre, yielded a number of species, especially in early summer, when sheets of umbelliferous flowers were in bloom.

In the following list, where no locality is given, the Kishon plain is understood.

Mutillidae.—*Mutilla villosa*, Klug., Haifa, July.

Sphegidae.—*Bembex oculata*, Latr., July; *B. mediterranea*, Handl., July; *Philanthus triangulum*, F., July; *Sceliphron spirifer*, L., Jerusalem, October, and Tabgha (near Capernium), August; *Sphex sordidus*, Dhlb., and *Ammophila propinqua*, Tasch., Athlit, July; *Stizus respoides*, Walk., and *S. niloticus*, Handl., July.

Vespidæ.—*Vespa orientalis*, F., abundant in most parts of Palestine; *Polistes gallica*, L., July and August.

Eumenidae.—*Eumenes lepelletieri*, Saus., Jerusalem, October; *E. arbustorum*, H.S., July.

Apidae.—*Anthophora dispar*, Lep., Mount Carmel, January; *A. albigena*, Lep., Athlit, July; *A. senescens*, Lep., Beisan (500 feet below sea), January; *Andrena morio*, Brullé, fairly common in May; *Apis mellifera*, L., Mount Carmel, January; *Crocisa luctuosa*, Lep., Nazareth, March; *C. major*, Mor., Athlit, July; *Ceratina tibialis*, Morawitz, and *Eucera longicornis*, L., Nazareth, March; *E. longicornis*, Friese (nec L.), Jerusalem, April; *E. nigrilabris*, Lep., Beisan, January; *E. grisea*, F., Jerusalem, April; *Sphecodes fuscipennis*, Germ., July; *Megachile argentata*, F., July; *Anthidium insulare*, Morawitz, May; *Halictus? calceatus*, var. *orientalis*, Magretti, August.

Evanidae.—*Evania appendigaster*, L., several caught in a bathroom at Haifa, August.

Ichneumonidae.—*Allocamptus undulatus*, Grav., Haifa, at light

in March. *Ophion asiaticus*, Kok. ?, Haifa, not uncommon at light in January.

Scoliidae.—*Dielis collaris*, F., July and August; *Scolia maura*, F., May and July.

Chrysididae.—*Chrysis simplex*, Dahlb., May.

RHYNCHOTA.

A few individuals of the common and more conspicuous members of this Order were collected from time to time for the sake of the localities and times of appearance.

Whilst working for *Hymenoptera* amongst the sandhills and wastes of the Plain of Esdraelon near the mouth of the Kishon river, several species were seen in numbers on flowers. *Harpactor punctiventris*, H.S., a large orange and black species, occurred in July and August, 1920, together with *Graphosoma lineatum*, L., a roundish species, with longitudinal stripes of black and red. *Harpactor iracundus*, Poda, was taken from amongst grass at Haifa, 21. v. 20.

Several species were found commonly under stones and rocks when searching for Coleoptera, such as *Microtoma atrata*, Goeze, Mount Carmel, December, 1919, and Nazareth, February, 1920. *Prostemma guttata*, F., in the same localities in January and February. *Amaurocoris curtus*, Br., and *Lygus contaminatus*, Fall., Mount Carmel, December.

Lygus pumilus, Scop., was seen commonly in January at Beisan, on flowers and herbage, and specimens were also observed at Semakh, on the southern shores of the Sea of Galilee.

In April, 1920, during a few days' collecting on the hills round Jerusalem, *Schirus dubius*, Scop., and *Eurydema fieberi*, Sch. and Fieb., were taken. The last-named had also been collected at Nazareth in March. Another species occurring both at Nazareth and Haifa was *Eurygaster maurus*, L., in March and June.

Ectomocoris ululans, Rossi, came to light at Haifa in summer, and a nymph of this species was taken whilst biting a man's leg in August, 1919.

Another species which came to light was *Reduvius pallides*, Klug., from May to August, 1919, and 1920, at both Haifa and Jenin.

In July, 1919, I caught at Haifa, amongst others, *Nysius thymi*, Wulff, *Macrosegitus brunneus*, F., and *Pyrhocoris apterus*, L.

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

BY F. C. BOWDITCH.

Dircema jacobyi sp. nov.

Size of *nigripennis* Fabr., rufous; all the head (except the lower

face), the antennae except last two joints, apex of femora and tibiae and tarsi black; elytra olivaceous black or cyanescent, apex sinuate with sutural angle distinctly mucronate.

Type: San Augustine Mapiri, various points in Ecuador and Bolivia. Length 9 and 10 mm. (Coll. Bow.).

Head with front and vertex finely punctate and lightly longitudinally furrowed; antennae reaching about the middle of the elytra, the apex of last joint dark; thorax typically formed like *nigripennis*, finely and rather sparingly punctate; elytra very thickly and finely punctate pubescent, giving the velvety look, like *nigripennis*; the elytra show no signs of light margins like *lactum* Baly; the colour varies from almost black to quite green, or purple; the thoracic punctures are stronger in the ♂, the sexes being easily separated by the abdominal notches as stated by Baly in Ann. Nat. Hist., xvi: one of my specimens is from the Jac. Coll. marked "Ecuador n.i.M."

Coelomera janthinipennis sp. nov.

Black, with the elytra bright steel blue, the latter thickly, finely punctate, with sparse short pubescence.

Type: 1 example, green label (Marcapata), Peru. Length 14 mm. (Coll. Bow.).

Var. A: 3 examples from Pachitea, Peru, having the elytra nearly black.

Antennae reaching the middle of the elytra; joint 3 long and stout; head with noticeably swollen and almost smooth vertex (like *azureo-fasciata* Blanch.), with a frontal fovea and a fine impressed line extending therefrom to the thorax, which has the usual shape and fovea for the genera, with a few scattered punctures; scutellum quadrate, with a few punctures; elytra nearly parallel, uniformly and thickly punctate, with a basal depression within the shoulder; the colour and swollen front easily separates this species; the colour of the elytra is nearly that of *Buckleyi* Jac.

Coelomera opaca sp. nov.

Black, elytra dull reddish purple, apical half of all the femora light rufous, the entire upper surface, dull semi-opaque, caused mostly by the very close and rugose punctuation.

Type: 1 example, Chacomayo, Peru (2nd Jac. Coll.), n.i.M. Length 12 mm. (Coll. Bow.).

Antennae reaching to middle of elytra; three last joints pale brown, front and vertex punctate, flattened, with a well-defined longitudinal furrow; thorax of usual shape, rather thickly punctate; scutel wider than long, longitudinally impressed; elytra broader behind, very closely and finely rugosely punctate, obsoletely depressed at the scutel and shoulders, the entire upper surface sparsely

pubescent; the last abdominal segment is more or less rufous; the colour of the elytra is different from all the other forms—a dull reddish purple.

***Coelomera jacobyi* sp. nov.**

Black; clypeus, labrum, joints 9-11 of the antennae, thorax and apex of femora yellow, elytra dull steel blue (like bright forms of *lanio*) with very short pubescence.

Type: 1 example. Chancomayo, Peru (2nd Jac. Coll.), n.i.M. Length 13 mm. (Coll. Bow.).

Antennae reaching the middle of the elytra; joints 9-11 flavous; head with deep cross furrow between the vertex and front, the latter concave and punctate with a carina down the middle; thorax with the edges thickly and coarsely punctate; elytra slightly dilated behind and obsoletely depressed at scutellum and shoulders; punctuation very fine and rugose. I place it next *Buckleji* Jac.

(To be continued.)

NOTES AND OBSERVATIONS.

Information Desired.—In Entomologist, xxiii, p. 207, the following announcement was made: "At a meeting of the South London Entomological and Natural History Society held April 24th, 1890, Mr. Rice, on behalf of Mr. H. Syer Cuming, exhibited, among other documents, the original rules and constitution of the Aurelian Society, bearing date June 1st, 1801: the rules and objects of the Entomological Society of London, founded on the Aurelian Society, and dated May 1st, 1806—both being signed by the founders of the two Societies; a printed book of byelaws of the latter Society, date 1807; an autograph letter and circular, signed by A. H. Haworth, dissolving the Entomological Society of London, date April 10th, 1806; a priced catalogue of Haworth's Collection, sold at Stevens's June 23rd, 1834, and ten following days; and a catalogue of insects belonging to the Entomological Society, sold at Stevens's April 16th, 1858."

I shall be greatly obliged if anyone can inform me of the present location of the above documents, or any of them; or of Mr. Syer Cuming or of any living representatives of his family. I gather that he resided in 1890 in the Kennington Park Road, and was connected in some official way with the British Archaeologists' Association.—W. G. SHELDON; West Watch, Limpsfield, Surrey.

A MALE COLIAS CROCEUS VAR. HELICE.—The statement is made by Mr. Stanley N. A. Jacobs, on p. 259 of the preceding volume of this journal, that he had seen a male of *C. croceus* of the *helice* form in the collection of Mr. F. F. Wood. The occurrence seemed very extraordinary at the time it was reported, but on the authority of Mr. Jacobs and Mr. Wood was passed for publication. Mr. Wood

writes us now, however, that he has very carefully re-examined the specimen, and that, as was to be anticipated, it proves to be a female. Both he and Mr. Jacobs wish that their error should be corrected in these pages, and express their regret that the mistake should ever have arisen. Mr. Wood states that he was deceived in the first place by the fact that the black borders to the wings in the specimen concerned were devoid of the usual pale markings peculiar to the female.—N. D. R.

EARLY APPEARANCE OF *VANESSA URTICAE*.—On February 2nd I was pleased to capture a specimen of *Vanessa urticae* var. *polaris*. It was flying in the sunshine outside the Welby Memorial Home. I think that this is exceptionally early for this species. The earliest that I have seen it before was on March 10th, 1922 (see Entomologist, vol. lv, p. 88).—L. H. BOND; The Cottage, Welby Gardens, Grantham.

Pyrameis atalanta.—On the 22nd of the present month, a very spring-like day, a specimen of *P. atalanta* was seen flying about my garden. This makes it appear that in the south of England this species hibernates in mild winters. A few years past I found a specimen hibernating in mid-winter in the bark of a cork tree.—G. NOBBS; North Lodge, E. Cowes, I. of Wight, January 24th, 1923.

MELITAEA AURINIA IN WARWICKSHIRE IN 1922.—In connection with Mr. E. Bolton King's note (p. 19 *ante*) on the capture of a specimen of *M. aurinia* near Warwick, I should like to report that I also took a single specimen on June 4th last at a spot about midway between Coventry and Kenilworth. It was on ground that I had worked for some years, but I had never before observed the species; and although on this occasion I subsequently spent an hour in the immediate vicinity on the look-out for it, I saw no other specimen.—G. M. RUSSELL; 53, Eglinton Hill, S.E. 18.

UNCOMMON SPECIES AT HAVANT.—The following species have been taken in my garden at Havant during recent years: *Laphygma exigua*, July 17th, 1920; *Leucania vitellina*, October 5th, 1922; *Ephestia semirufa* (Haw.) Stn., at light on sheet, June 10th and July 15th, 1922.—JOHN E. EASTWOOD, F.E.S.; Wade Court, Havant.

PROLONGED PUPAL STAGE IN *SATURNIA CARPINI*.—I had a large number of cocoons of the above in 1916, not all of which came out. On Monday last, January 8th, a female emerged from the lumber room in which they had been kept and forgotten.—B. PRITCHARD; Headingly, Shrewsbury, January, 1923.

MACROPTEROUS *METRIOPTERA ROËSELII*, HAG., IN HAUTE SAVOIE.—While collecting Orthoptera near Argentière on September 5th last year I took a fully developed macropterous male *Metrioptera roeselii*, Hag., var. *diluta*, Charp., the identification of which Mr. W. J. Lucas has kindly verified for me. It was in a field of long grass, in company with large numbers of the typical *M. roeselii* and *Phasgonura cantans*. The wings and elytra measure 19 mm., and exceed the posterior femora by 3 mm.; the elytra are pellucid with

distinctly marked dark nervures. The body measures 16 mm., and apart from the organs of flight, the insect apparently agrees with typical *M. roeselii*, Hag.—T. F. HEWER; 24, West Shrubby, Redland, Bristol.

HYBRIDISATION IN NATURE.—As a further instance of this, I should like to record that at noon on July 31st, 1919, I caught a paired couple of brown butterflies (flying about six feet from the ground) outside Hazeleigh Wood, near Maldon in Sussex. The male was a worn *Epinephele jurtina*, and the female a dilapidated *Aphantopus hyperanthus*. The couple separated at 4.45 p.m. the same day. By 5 p.m. next day the female had laid many eggs loose on some soil—only one could I see fastened to a blade of grass. None of the eggs hatched. Subsequently I made many vain attempts to pair the two species in captivity.—(Rev.) GILBERT H. RAYNOR; The Lilacs, Brampton, Huntingdon, February 10th, 1923.

FURTHER COLOUR VARIETIES FROM THE CHILTERNs.—I should like to add a few further instances of colour variation in butterflies from the Chilterns, concerning captures made since writing my earlier report published in the August, 1922, number of this Journal. They are: *Melanargia galathea*, taken last August, a specimen with a deep olive-buff ground-colour, but in which the pupils of the eyespots on the secondaries still retain their bluish-white colour; *Aglais urticae* v. *alba*, a perfect specimen in September, and a male of *Pararge megera* with a pearly white ground, the last-named unfortunately in a badly battered state, although when first seen by my wife at an earlier date it was in fairly good condition. It was eventually captured along the same stretch of bank where first seen—a piece of roadside it claimed as its own, most energetically patrolling and chasing well away every other butterfly that came within range, and then returning again to its beat. This species (*megera*) is increasing nicely in this district. The brood of last August and September was quite plentiful.—G. B. OLIVER; High Wycombe.

VARIATION IN BUTTERFLIES.—In a review of my friend F. W. Frohawk's coming work on the British Lepidoptera, we are told that if the two volumes, when published, show the same high standard as shown in the plate of *Vanessa* in the prospectus, we could only wish that Mr. Frohawk had not confined his attentions to the *Rhopalocera* alone. Well, I have seen the whole of the coloured drawings, and all are as perfect as human skill, backed by entomological knowledge, could make them; but, alas, life does not extend to a thousand years, and Frohawk would need all that time, and perhaps more, to work out and illustrate in a similar manner the life-histories of all the British moths.

However, this is not the point in the above review upon which I should wish to comment. To me the variation of species is a matter of the highest interest, not only as indicating relationship to allied forms and the steps by which they have diverged, but as reversions to ancestral types. There can be no doubt that the earliest forms of Lepidoptera were black or brown, white, or a combination of

these hues; so that all abnormal examples tending towards melanism or albinism are throw-backs to an ancestral form, and sometimes nearly approach allied species which have been less modified from the original parental type. I think without question that *Argynnis paphia* was originally a black fritillary, the variety of the female (*valesina* and its black form), as also the heavily black-streaked forms of the male, being reversions towards its ancient colouring. The tendency of the black patches in *Vanessa urticae* to unite into a more or less defined band across the front wing as in the allied Japanese species, the suffusion of the white bands and spots in varieties of *Limenitis sibylla* and *Apatura iris* all seem to indicate reversion to black progenitors, whereas the tendency of *Epinephele jurtina* and some other Satyrine butterflies to exhibit creamy whitish patches on the wings points to albinistic ancestors: we might, indeed safely conclude that such ringlet butterflies as still retain that type of colouring have undergone very slight change from their original hue.

I doubt whether it would be possible to cross two not very closely related species of Lepidoptera, as has been done with birds; if so, a reproduction of characters peculiar to the remote ancestor of both types might be expected to reappear in the offspring, as I demonstrated years ago in a hybrid finch bred between the Diamond- and Zebra-finches of Australia, which not only had a crimson breast (a character not possessed by either parent, though indicated in a species related to the Diamond-finch), but various markings characteristic of other more or less nearly related species.* Oddly enough an example of the Diamond-finch which died some time later in one of my aviaries showed a rose-coloured fringe to two or three of the breast-feathers, thus confirming my conclusion.—A. G. BUTLER, Ph.D., F.L.S., F.Z.S., etc., 126, Beckenham Road, Beckenham.

[I am sorry that Dr. Butler should have thought fit to take me to task over a remark in the advance notice of Mr. Frohawk's forthcoming book, concerning unusual aberrations. It is hardly necessary for me to say that it was not intended to cast any reflection on the study of variation, the possibilities of which Dr. Butler very clearly indicates. Rather was it intended to try to discourage that type of collector whose one ambition seems to be to have unusual aberrations, not for the sake of study, but, one is forced to conclude, mainly for the joy of possession, and who takes no thought of the preservation of the species in those of its haunts he ravages. But for the activities of such collectors as these it would be unnecessary to have to publish such appeals as that of Mr. G. B. Oliver's (*Entom.*, lv, p. 186, 1922) on the subject of *Lycaena adonis*, which not only reflect no credit on the "aberration hunter," but are a disgrace to British Entomology.

With regard to the nature of the creamy-white patches so common on the wings of Satyrine butterflies, I would refer Dr. Butler to Dr. Cockayne's very able paper (*London Naturalist* for the year 1921, p. 51) on structural abnormalities in Lepidoptera.—N. D. R.]

* Notes on Hybrid Ploceidae (*Avicultural Magazine*, October, 1906, pp. 345-354).

HAS *NYGMIA PHAEORRHOEA*, DON., AGAIN FORSAKEN US?—For more than twenty years a colony of *Nygmia phaeorrhoea*, better known perhaps as *Porthesia chrysorrhoea* (the Brown-tail Moth) existed on a patch of blackthorn bushes that grow on the edge of the cliff near Beachy Head. During those years it varied much in strength of numbers; at times, as notably in 1907, it increased to such an extent that the half-grown larvæ, having consumed all the leaves of the blackthorn, wandered over the surrounding country, devouring all the bramble, whitethorn and so forth that they could find. Then for a few years the species was only moderately common, but again became very abundant in 1916 and 1917, after which it again settled down to normal conditions. But for a couple of years past it appears completely to have disappeared from its usual haunts. I have carefully searched the bushes in winter for "nests," which, when the leaves are off, are conspicuous objects, looking much like pieces of sheep's wool attached to the twigs, but failed to find any, nor was I able to discover either larvæ or imagines during the whole of last spring and summer, although frequently about the spot.

The history of the species, so far as it relates to its occurrence in this country, is fairly well known for nearly the past two hundred years, and from it we gather that periods of great abundance are often followed by the practical, or it may be complete disappearance of the species throughout the whole country (see Proc. South Lond. Ent. and Nat. Hist. Soc., 1907, p. 12).

There is no doubt that at the times of its greatest abundance the species is liable to become a serious orchard pest, and any points in its economy that we may be able from time to time to elucidate may be of importance. In this connection I may mention that in 1917 I sent a large number of larvæ to Dr. W. R. Thompson, who informed me that he found by dissection that several of them were infested by the Dipterous parasite *Comptosia* (*Phorocera*) *concinna*, Meig., and by another not certainly identified. Possibly this may have been the cause of the disappearance of the species from this neighbourhood. Be that as it may, it would be interesting to know whether this is an isolated case, or whether the species has also disappeared from other localities where it has been more or less common during recent years. The winter "nests" are not difficult to detect where they exist, and as spring advances and they are increased in size by the growing larvæ they soon become conspicuous objects, and I appeal to those who have had the species under notice in various localities during the past few years or who may have any present information regarding it to publish the result of their observations.—ROBERT ADKIN: Eastbourne, January, 1923.

PHENOLOGY, OR THE SCIENCE OF APPEARANCES.—We have received from Mr. J. D. Margary, of Chartham Park, East Grinstead, a copy of a paper by Mr. Edward Mawley on the subject of phenological observations. Accompanying it is a schedule of the species of insects, birds and plants on the times of appearance of which the observations are to be made. The insects concerned are only six in number. *Apis mellifica*, *Vespa vulgaris*, *Pieris rapae*, *Euchloë cardamines*, *Euprepia jurtina* and *Bombus lapidarius*. All that is

required of the observer is that he should note against each species the date when first seen in his neighbourhood. In addition, however, notes on insect life generally (such as unusual scarcity or abundance of particular species) will be welcomed, and the whole will be analysed in conjunction with meteorological observations and published in an annual report. The assistance of a number of observers throughout the country is very much desired, and any reader who would care to co-operate will be gladly supplied with the necessary forms and information on application to Mr. Margary, Mr. J. E. Clarke, 41, Downscourt Road, Purley, or to the Royal Meteorological Society, 49, Cromwell Road, S.W. 7.—N. D. R.

THE HORNE COLLECTION.—It is not often that a collection of British Lepidoptera finds its way under the hammer in such generally fine order as that got together by the late Arthur Horne of Aberdeen, the first portion of which, consisting of the butterflies, was offered at Stevens's Auction Rooms on Tuesday, January 30th, last. Horne was for many years a strenuous collector, and by reason of his residence in Scotland had many opportunities of securing unusually fine series of many of the local species, in addition to which he was generally well to the fore whenever, during his time, any of the renowned old collections were being disposed of, and although, as will be seen, some of the remarkable varieties he had obtained in this latter way did not realise quite such excessive prices as they had on former occasions, many of his own fine series of local species were eagerly sought after. Competition commenced with lot 5, a very nice form of *Papilio machaon* with large diffused markings, which ran up to £11. *Pieris brassicae* was put up in two lots, each containing ten pink suffused specimens of Horne's rearing and other forms, the one of thirty males bringing 40s. and the other of forty females 32s. 6d., while a lot of seventy *P. rapae* females which included some nice Irish buff forms made £3 3s. The series of *P. napi* was a fine one, consisting largely of Scotch and Irish forms, the latter including a number of a canary-yellow race of Donegal origin; these latter were distributed throughout the various lots, six in a lot of fifteen making 70s., seven in a lot of fourteen 65s., six in a similar lot 60s., three in a lot of forty-two 45s., five in a lot of fourteen 65s., five in a lot of twenty-eight with two ochreous specimens 63s., five in a lot of forty-five with one approaching race *bryoniae* 80s., three in a lot of fifteen with a very smoky var. 70s., six in another of fifteen 63s., and two in a lot of sixty undersides 45s. A *Euchloris cardamines* with the left side streaked male colour and the right male made £5 as against 50s. when sold in the Webb Collection, but the female with large orange areas on both upper- and undersides sold for £6 as against £8 at the Farn sale, while others similarly but less strongly marked made 42s., 63s., 65s. and 70s. apiece. The seven specimens of *Pontia daplidice* sold at from 18s. to 40s. each, and the only *Gonepteryx rhamni* that was at all remarkable, a gynandromorph in which the male coloration predominated, made 70s. *Colias croceus* ab. *chrysotheme* sold for 65s. as against 45s. at Farn's sale; *C. edusa* clouded with black on disc of all wings brought 80s., a dusky female 75s. and a bright lemon-coloured var. *helice* 40s., while a *C. hyale* with much

diffused black tips made 60s. There were several fine blotched and rayed varieties of *Argynnis paphia* and the prices realised for the best of them were £6 10s., £5 5s., £6 10s. and £13, while a var. *valezina* with a large bright tawny mark along the costa and outer margin of the left wing ran up to £17, and an almost black one £18 as against £17 at Farn's sale. The two best *A. aglaia* were Horne's own captures: one from Murtle, a richly marked specimen with black hind-wings, made £14, and the other, very dark and clouded, from Balmoral, £7, and two underside *A. cydippe* (*adippe*), the one with almost obsolete hind wings 50s., and the other with large silver blotches at base £4 15s. The two best *Brenthis selene* also were Scotch specimens: one from Kintore without any discal markings but heavy black dashes on borders reached £17, and the other from Kemnay, much clouded with black, made £14, while other clouded and rayed specimens sold for 55s., £7 and £5, a pale golden one for 70s., a silvery-white for 90s., and two nicely rayed undersides for £5 and £5 10s. respectively. A very remarkable *B. euphrosyne*, in which the spots were replaced by black zigzag transverse lines, made £11, black-rayed and blotched forms £7 against £8 10s. at Farn's sale, £6 10s. against £9 at Webb's, and £5 10s. and £7, a cream-coloured specimen 70s. and a nicely rayed underside £8 10s. *Issoria lathonia* were rather at a discount; one having been sold for 25s., the remainder were put up in couples, which went for from 27s. 6d. to 55s. Three fine series of *Melitaea aurinia* (*artemis*) from Oban made 70s., 90s. and 95s. per lot, a subdiaphanous specimen 32s. 6d.: an exceptionally dark Donegal one 42s.; a very dark *M. athalia* described as var. *navarina* 80s.: some exceptionally light and dark forms of *M. cinxia* in a lot of sixteen the same price, and a lot of nine undersides, some with exceptionally black marked bands, £5 per lot. The best *Polygonia c-album* was Farn's, Ganarew, silvery-white specimen, which, when his collection was sold, fell to Horne for twenty guineas: it now made as many pounds; other good forms were a dark purplish-brown specimen which sold for £6, and two golden-yellow varieties which brought 70s. and 50s. respectively. *Aglais urticae* with united costal blotches made £5 10s., and two others similar but not so good 65s. each, with silvery-white ground-colour £5 15s. 6d., with pale yellowish ground 65s. and 60s., and with blue streaks in fore wings 45s. *Vanessa io* with rings round ocelli and whitish border to wings made 80s., and one with greenish ocelli 75s.: we believe these are the specimens that sold for £11 and £12 12s. respectively at Webb's sale: specimens with obsolete ocelli brought 65s. and 40s. each, one with the addition of a large black costal patch £8; and *Pyrameis atalanta* with pale yellowish pink bands £5 and with orange-yellow bands 50s. *Limenitis sibylla* practically without the white bands sold for 50s., 55s. and 60s., and similar varieties of *Apatura iris* for £8 10s. and £9. There were three very fine series of *Erebia epiphron* (*cassiope*), one of seventy-three specimens from Cumberland, Westmorland and Rannoch which made 35s., one of sixty-nine from Rannoch 50s., and the other of sixty-eight from Rannoch and Oban, including some undersides, 80s. Also of *E. aethiops* (*blandina*), one of thirty-two from Rannoch and Forres 30s., and others of forty-two and fifty-six each including some undersides 42s. and 40s. respectively; a

deep purple-brown specimen from Gareloch brought 45s., and a very light one from Moray 25s. A "golden" male *Epinephele tithonus* sold for 55s., another similar for 35s., and a silvery-white one for 25s.: two light golden-brown *E. jurtina* for 60s. each, one without ocelli for 32s. 6d., a "white" underside for 55s., a light brown specimen with large orange disc for 42s., and a series of six picked forms for 45s. There were eleven lots of *Coenonympha typhon (davus)* averaging from four to five dozen specimens each; they were very nice series and produced from 30s. to 90s. per lot, the highest price paid being for the heavily marked Delamere, etc., series set to show the underside although some of the Scotch specimens worked out at little less than 1s. apiece. The fifteen *Chrysophanus dispar* offered made from about £5 to £6 for what were described as good specimens to £7 to 9 guineas for the more perfect, and an exceptionally large one with extra spots ran up to £11. A *C. phlaeas* with large confluent spots made £10 as against £12 paid for it at Webb's sale, and a pale golden specimen with two silvery-white ones brought 63s. the lot, but other varieties of this species did not bring big prices, and some of them showed considerable depreciation on the prices paid for them at former sales. There were some fine series of *Lycaena astrarche (agestis)*, of which one of sixty-six specimens, including vars. *quadripuncta*, *allous* and *artaxerxes*, sold for £4, two of sixty-six undersides each for £5 10s. and £4 respectively, a dark underside specimen of var. *salmacis* for 40s., a fine white underside with red marginal spots and black dashes in the fore wings for £5 against £9 paid for it at Farn's sale, and a lot of three *Plebeius aegon* including two pale lilac specimens for 60s. The series of *Polyommatus icarus (alexis)* were also very fine and consisted largely of Scotch and Irish forms: they were put up in lots of fifty to seventy specimens, and the best of them sold for from 70s. to 95s. per lot; twenty-one undersides including several streaked forms made 75s., another of twenty-two 80s., a single specimen with broad black streaks £6, and one with confluent spots 35s. *Agriades coridon* were largely from the Chilterns and North Downs, and short series of picked forms were in request; thus one of eight specimens made 50s., and another of like number 55s., one of four of the *syngrapha* forms 45s., two of nine each 80s. and 70s., and one of fourteen 70s. Among the specimens sold singly a fine gynandromorph ran up to £11 10s., another £5 10s., and one with base bluish and brownish-black beyond 70s. Among the undersides an almost spotless white one brought 70s., one with black basal dashes and bands towards margins of hind wings 84s., a sparsely spotted one with somewhat rayed reddish border 70s., and an exceptional buff-brown specimen with rayed margins and streaked hind wings £9 10s. Picked series of *A. bellargus* of about fifty specimens each made anything from 18s. to 60s., a pale lilac blue specimen 35s., and six leaden-grey "black" forms from 25s. to 35s. each; two series of nine undersides including some more or less rayed examples 47s. 6d. and 45s. respectively, while among the specimens sold singly one with deep black streaks in hind wings and rayed margins made £6 10s., and others of a similar form but less strongly marked 50s., 30s., and 25s. Two pale specimens of *Celastrina argiolus* of varying tints sold for 25s. and 20s. respectively, and a good gynandromorph, left side female, right male, together with a dusky

specimen, for £7—just half the price that was given for the gynandromorph alone at the sale of Oliver's collection in February, 1919. *Lycaena arion* in lots of sixteen to eighteen made from 25s. to 35s. per lot, *Nomiades semiargus (acis)* in lots of three 22s. to 45s. per lot; an almost unicolorous buff *Nemeobius lucina* 30s.; a cream-coloured male *Agriades comma* 25s., and an underside of the same species without markings 35s.; we believe the two last mentioned specimens were sold in one lot at Webb's sale for £8 10s. The handsome cabinet of sixty-four drawers with book-case over ran up to £105 before the hammer fell. The total of the day's sale was, in round numbers, £1320, which compares with £750 for the first day of the sale of the Farn Collection, but that covered only a portion of the butterflies, which subsequently reached a total of just over £1400, but as we understand that some of the *C. dispar* have been held over for a future occasion there is good prospect of the Horne butterflies exceeding even that large total.

R. A.

RECENT LITERATURE.

In the Scottish Naturalist the following articles of interest to entomologists have appeared during the second half of 1922:

(1) *On the Ischnocera (Bird Lice or Mallophaga) parasitic upon British Grouse*, by J. WATERSTON, D.Sc. (2) *Some Insect Records from the Edinburgh District in 1921*, by W. EVANS. (3) *Notes on the Poplar Saw-fly (Trichiocampus riminalis, Fall)*, by R. C. FISHER, B.Sc. (4) *Additions to the Lists of Clyde Coleoptera (Third Series)*, by A. FERGUSON. (5) *Notes on the Wood-wasps (Sirex) occurring in Scotland*, by W. EVANS, pp. 175-189. Nos. 3 and 5 will be found of general interest to entomologists, not simply to those of the north. The last, by a naturalist whose loss will be much felt, is an important and very comprehensive paper.

W. J. L.

The Singapore Naturalist. Official Organ of the Singapore Natural History Society. No 1, 80 pp., 8vo. Singapore, July, 1922.

THE first number of this Journal, just to hand, contains several interesting papers, of which we may mention specially that by Dr. G. E. Brooke on *The Identification of Malayan Culicidae*, composed mainly of keys, and the paper by Mr. F. N. Chosen on *Preserving Animals*. But the feature of the magazine is the eloquent testimony to the energy of the members of the Society which is borne by the reports of the Proceedings. In the Editorial the statement is made that "In Singapore there is probable a greater scope for a field observer of simple tastes than for a trained systematic naturalist . . . and with this wealth of material at our disposal there should be no shortage of original papers for many years." We should think not indeed! And if the Society lives up to the promise of its first publication we shall expect much from it in its future numbers.—N. D. R.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Annual Meeting, January 17th, 1923.*—Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc., Vice-President, in the Chair. Dr. S. A. Neave read the Report of the Council, which was adopted on the motion of Mr. G. T. Bethune-Baker, seconded by Commdr. J. J. Walker. Mr. W. G. Sheldon, Treasurer, read his Report and gave some details of the highly satisfactory financial condition of the Society. The Report and Accounts were adopted unanimously on the motion of Dr. C. J. Gahan, seconded by Mr. W. Rait-Smith. It was announced from the Chair that the Fellows nominated as Officers and Council for the ensuing year had been duly elected in accordance with the Bye-Laws. In the absence of the President owing to illness, his address *On Some Aspects of Variation in Lepidoptera* was read by Dr. S. A. Neave, and at its conclusion a vote of thanks to the President, coupled with a request that it might be printed in the Proceedings, was moved by Mr. E. E. Green, seconded by Mr. G. T. Bethune-Baker, and carried unanimously. A vote of thanks to the Officers for their services was then passed on the motion of Prof. E. B. Poulton, seconded by Mr. F. D. Morice, and Mr. W. G. Sheldon. Dr. S. A. Neave, and Mr. H. J. Turner briefly replied.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*December 16th, 1922.*—Mr. E. J. Bunnett, President, in the Chair.—Messrs. W. H. T. Tams, 19, Sullivan Road, Hurlingham, S.W. 6; F. G. Mann, B.Sc., Chemical Laboratories, Pembroke Street, Cambridge; and John Robertson, M.R.C.S., L.R.C.P., F.Z.S., 69, Bedford Road, S.W. 4, were elected members. Mr. C. L. Withycombe exhibited the following species of Neuroptera in support of the fact that in the Order there often appears to be a tendency to reduction of the hind wings, but as a rule not to complete reduction: *Glenoleon indecisum* (Queensland), *Cymothales* sp. (Africa), *Chasmoptera sheppardi* (Asia Minor), *Nemoptera bipennis* (Spain), etc.; Mr. R. Adkin, a series of a *Zygaena* sp. reared from pupae sent him by Lord Rothschild from the Chilterns near Tring. Fifty-seven examples were six-spotted, and 16 were five-spotted. When left to themselves there were no cross-pairing between the forms. He regarded the latter as *Z. loniceræ*; Mr. Hy. J. Turner, Mr. A. E. Tonge, Mr. Grosvenor and Col. Rattray exhibited various species, forms and races of *Zygaenidae*, and Mr. T. H. L. Grosvenor read a paper entitled *Notes on the Zygaenidae*, and a discussion ensued, it being generally stated that what was meant by the name *hippocrepidis* was not known, and surprise was expressed that confluence in the various species did not exhibit Mendelian characters.

January 11th, 1923.—The President in the Chair.—Messrs H. Baker-Sly, "Kingston," Edenbridge, Kent; J. P. Mutch, Church Road, Bexley Heath; C. J. V. Gray, School House, Bradfield College, Berks; R. C. Fisher, B.Sc., Forestry Museum, Kew Gardens; and L. G. Bowles, 193, Brockley Road, S.E., were elected members. Mr. H. Moore showed ♂ and ♀ *Argema moenas*, the Assam long-

tailed silk-moth, and an *Arctia caja* of very aberrant coloration he was presenting to the Society's Collection. Mr. A. A. W. Buckstone, a bred series of *Pyrameis atalanta*, the pupae having been exposed to a fluctuating warm temperature, and pointed out the emphasis of the yellow coloration, and a similarly circumstanced series of *Aglais urticae* of which the yellow coloration was pronounced. Mr. Hy. J. Turner, a series of the beautiful *Colias behri* taken in the Yosemite region of California at 9700 ft. elevation by Mr. G. B. Pearson; a pair of the N. American Parnassiid *Parnassius clodius*, and a short series of the very small Pierid *Nathalis iole*. Mr. G. W. Young, F.Z.S., read a paper entitled The Geological History of Insects, and showed a series of lantern-slides in illustration. Mr. R. Adkin, as delegate to the Conference of Corresponding Societies of the British Association, read his Report of the Meeting at Hull. — Hy. J. TURNER, *Hon. Editor of Proceedings*.

LONDON NATURAL HISTORY SOCIETY. *Annual General Meeting, December 5th, 1922.*—Mr. E. B. Bishop, President, in the Chair.—Mr. L. B. Hall communicated a list of the Plant Galls he had noted during June and July in Somerset, including *Eriophyes convolvens* on *Euonymus europaeus*, *E. pyri* on *Pyrus aria* var. *rupicola*, *E. rubiae* on *Rubia peregrina*, *E. stenaspis* and *E. nerrisequis* var. *maculifer* on *Fagus sylvatica*, *Andricus curvator*, *Neuroterus baccarum* and *N. vesicatrix* on *Quercus robur* var. *intermedia*. The President delivered an interesting address on the extreme localness of certain species of plants and butterflies.

January 2nd, 1923.—Mr. Bishop, President, in the Chair.—Dr. M. Culpin exhibited a number of Lepidoptera he had collected in North Queensland, and read a paper on the natural history of that part of Australia. Mr. Collenette drew attention to the resemblance between the butterflies exhibited and those from near Singapore, where there were several closely allied species, whereas the moths were evidently not related as closely. Mr. Burkill exhibited galls of *Liparis lucens* on *Phragmites communis*, *Diastrophus rubi* and *Lasioptera rubi*, on Bramble—all from near Esher.

January 16th.—Meeting of the Plant Gall Section; Mr. R. W. Robbins in the Chair.—The occurrence of *Eriophyes hippocastani* on *Aesculus hippocastanum* and *E. varius* on *Populus tremula*, both from Surrey, was recorded. A paper was read on the various species of galls found on plants comprising the order Rubiaceae.—H. J. BURKILL, *Minuting Secretary*.

OBITUARY.

WE regret to hear of the death of Percy C. Reid on January 15th last.

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PERONEA HASTIANA L.: ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

(With Plate II.)

BY W. G. SHELDON, F.Z.S., F.E.S.

A GREAT deal can be written about this, in many respects, most remarkable lepidopteron, that should be of interest to students of the Order, for although it was described by Linné in 1758, and its food-plants and larva have been known for several generations, more than a cursory description of the final stage of the larva does not exist. As to knowledge of the variation—and in this respect *P. hastiana* is certainly one of the most polymorphic species occurring in the British Islands—the whole question is in a state of chaos. Many of the forms bear more than one name; others equally distinct are without names; others again bear names the sponsor never intended they should carry: and in one case at least, there is very good reason to believe, an insect which for over 100 years has been generally understood to be an aberration of *hastiana* is not that species at all! This paper is intended as an effort to remedy these omissions.

For several years I have been endeavouring to accumulate the necessary knowledge and material to enable me to undertake the task, but the difficulty in obtaining ova, with which to note and work out the earlier stages, and the vast amount of material required to enable one to grasp the most intricate and confusing variation of the imago, has made it impossible to attain a standpoint from which I could deal with the subject with a reasonably sound judgment until now. The task has been attempted by others: the late J. A. Clark accumulated a large amount of material some twelve or fourteen years ago, and it was his intention to write a monograph on the species, similar to the one which he produced, in collaboration with the late J. W. Tutt, on the nearly allied *P. cristana*, in vol. xiii of the Entomologists' Record. But he did not live to complete his project, and Tutt only survived him for a short period. His material passed into other hands at the sale of his collections, and I understand is not now in Britain. I believe one individual

acquired the whole, but so far as I am aware, it has not been made use of in the manner the original owner intended.

P. hastiana, as before indicated, was first named and described by Linné, apparently from a Scandinavian example of the moth. His type is still in existence in his collection at the Linnean Society's rooms: it is in excellent condition, and agrees in every respect with his description, and with the figure of it in Clerck's *Icones*.

DISTRIBUTION.

P. hastiana is found locally throughout the British Isles, extending from Kent, the Isle of Wight, and Devonshire, in the south of England, to Caithness in the north of Scotland, and according to Barrett into the Orkney Islands. It is especially abundant in the Fen districts of the east of England, in the islands off the west coast of Sutherlandshire, and is found in Wales. I have examples from Sligo, and Barrett speaks of it as being found throughout Ireland.

In the south of England it is extremely local, and so far as I am aware is confined to a comparatively few localities, but in the eastern counties it is widely distributed and abundant. On the Lancashire coast it occurs commonly in various localities. In certain districts in Sutherlandshire I have found it in enormous numbers, and I understand this abundance obtains throughout large districts in northern Scotland. Some years ago I purchased at the sale of the late Sydney Webb's Collection his fine series of varieties: practically all bred by Frederick Bond from larvæ found on Wimbledon Common. I fear it has long disappeared from there, as well as from numerous other localities round London, where it was common in the days of John Curtis and J. F. Stephens. One of the finest series of varieties I have seen was bred in 1922 by the Rev. J. W. Metcalfe and Mr. E. D. Morgan from Devonshire larvæ.

Outside the British Islands *P. hastiana* is one of the most widely distributed of the Tortricid moths. According to Staudinger, *Cat. Lep. Pal.*, 1901 edition, the area of distribution extends over the whole of Europe (except Southern Italy and Greece) and Siberia. Either it, or a nearly allied species, is abundant in North America. In other words it is found wherever its food-plants (*Salix spp.*) occur.

HABITS AND DATES OF APPEARANCE OF THE IMAGO.

P. hastiana in Southern Britain has two broods in each year; this double broodedness extends at least as far north as Lancashire. In the Highlands of Scotland, however, it is single-brooded. Throughout the whole of Britain the winter is passed as an imago; apparently it hibernates with its wings closely pressed against the stems of the

food-plant, near the ground, and amongst the thick growths which usually surround them. In districts where it is double-brooded the larvæ of the first brood feed in May and early June, the resultant imagines, which are smaller than those of the second brood, emerging in July and August. These deposit ova at once, and the larvae are full grown in September and October. The second brood of moths emerges from the latter half of September until the end of the year, the great bulk of them during October.

In Scotland the larvae are found in the final instar towards the end of July, and in early August they pupate, emerging as imagines during the latter half of August and the first half of September. The time of emergence in these northern *hastiana* is not spread out over a period of several months, as is the case with southern specimens, for in 1921 I bred out 1038 moths from Sutherlandshire, between August 21st and September 17th, whilst 202 southern specimens bred in that year emerged from October 2nd to October 28th. These were, however, during the latter part of the time, brought into a warm greenhouse; had this method not been adopted odd examples would have emerged until Christmas, or even later. The Scotch *hastiana* are a fine large race, very richly coloured and extremely polymorphic.

In the Fen districts of Cambridgeshire, and elsewhere in the South of England, the large willow bushes seem alone to be frequented, dwarf willows (*Salix repens* and *S. herbacea*) apparently not being patronised at all; but I must make the reservation that on the coast of England these are the species of *Salix* chiefly—or in some localities exclusively—frequented; probably the reason for this is that other species of *Salix* are not found there. In Scotland, and especially in Sutherlandshire, I have found the small bushes of the larger species exclusively patronised. In this county, in the districts of Lochinver and Invershin, willow bushes of various species are abundant. In spots sheltered from the wind they will attain a height of several feet, but where wind-swept the bushes are dwarfed, and do not rise much above the surrounding growth, which consists chiefly of *Calluna*, *Erica* and *Myrica*. On such small shrubs each young twig will contain a larva, and many of them several, whilst on the larger bushes hardly one will be found.

It cannot be that the reason for this is that the larger bushes are so wind-swept they are distasteful to the parent moths; as a matter of fact they are only large because they grow in sheltered spots, whereas the dwarfed bushes usually grow in a wind-swept position. I was very much struck with this point in connection with a particular bush I found on the extreme headland stretching out into the sea, on the north side of the inlet of Lochinver. It grew at about 200 feet above sea-level, on a slope facing due west and fully exposed to all the gales so frequent on that wild coast. Under these con-

ditions, although it was a production of many years' growth, it had attained a height of six to nine inches only, with a circumference of from ten to twelve feet. Yet from that bush I filled a bag with tenanted twigs, containing, at a rough estimate, from 300 to 400 larvae, and when I had finished there was not a single twig left! I hope it will not be thought I was greedy, but if so I would point out that the larvae were literally in multitudes in the surrounding area. It would have been possible easily to have collected fifty or a hundred thousand, if one had been so disposed, and had the necessary accommodation for them.

I take it the reason why these smaller bushes are so thickly populated is the remarkably sluggish nature of the moth. Whilst staying at Lochinver I much desired to capture a gravid female for the purpose of obtaining ova, but, although I searched the sallow stems, beat the bushes, and searched them at night with a light, only one example was detected, and that was found in my umbrella whilst beating some thick mixed growth for miscellaneous larvae.

In the south of England, in the fen districts, I have occasionally netted a few moths at dusk, but they have been few and far between. I look upon *hastiana* as amongst the most secretive of our Lepidoptera.

LIFE-CYCLE.

One of the principal drawbacks to the study and knowledge of the earlier stages of the Tortricids at present is the inadequate and fragmentary description we possess of the larvae. The food-plants and other factors are well known in the great majority of cases, though not by any means in all—but the descriptions of the larvae, where they exist, almost invariably refer to only one instar, *without specifying to which instar the description applies*.

Now the larvae of most species vary very much in certain instars, and unless it is known to which instar a description applies that description is practically useless, for identification purposes at any rate. Barrett, who probably described more Tortrix larvae than any other writer, British or Continental, sometimes, but rarely, added to a description that the larva described was full grown: but in the great majority of cases even this information is wanting. As a matter of fact Tortrix larvae vary very little in superficial appearance, except in size, during the instars previous to the final one, but in the final instar there is usually a noticeable variation in appearance from that of the previous instars; this, however, in some species is not apparent until the instar nears completion. It is therefore necessary in describing a Tortricid larva not only to specify the instar the subject is in, but the particular stage in that instar.

In October, 1921, about a score of moths were put into a large

cage, containing branches of whitethorn and willow, and a quantity of dead leaves; this cage was placed on the north-western side of a yew bush, in such a position that the sun could not shine upon it. For several years previously I had been endeavouring to obtain ova without success, the moths having invariably been found to be dead in the spring. On March 4th, 1922, an examination of the contents of the cage was made, and thirteen moths were found to be alive and active. Several fresh willow branches were put in water and placed in the cage, and the moths put back. On April 1st the contents of the cage were turned out and examined; only four moths were then living. About 50 ova were found; these were exclusively fixed to the bark of the willow branches, all of them on the rough matured bark, and not one on the 1921 growth, which was greenish brown and smooth, or on the buds.

The great bulk of the ova were deposited singly, but in a number of cases in pairs, and in one instance in a cluster of three; they were in most cases inserted in the cracks, or on the rough places of the bark, and were very inconspicuous.

The ovum.—The length is 1.05 mm. and the breadth .35 mm.; it is oval in shape, the surface highly polished, granular, and somewhat opalescent. It is divided by raised margins into a large number of irregularly shaped spaces; the divisions themselves are curved lines; the polar axis is of course horizontal. The ovum, as is the case in the nearly allied *P. cristana*, consists of an outer and an inner envelope, but at this date (April 1st) there was no sign of a nucleus within the inner envelope.

The outer envelope is transparent and colourless; the inner envelope occupies about one-half of the surface area; the colour of this envelope is whitish green. This ovum was apparently newly deposited. The evidence points to the ova being deposited under wild conditions in March on the mature stems of willow—I am of course speaking of the double-brooded southern race; the pairing presumably takes place during the winter or early spring months.

On April 4th the inner envelope had become deep reddish brown in colour, and five days later this colour had spread over the whole of the ovum; on April 25th the black head of the embryo showed through the envelope, and the individual which was kept under observation during all its stages as ovum and larva emerged on April 27th.

The larva.—It was then, on emergence, 1.10 mm. long, the head was large, highly glabrous, and black, the lobes were prominent and the antennae were well developed; the prothoracic plate was brown, more pronounced in depth of colour at the rear; the remainder of the segments, claspers, and prolegs were greenish-white, the prolegs being tipped with black. In the first instar the larva fed upon the lower cuticle of two willow leaves placed one upon the other, eating

holes therein : probably in the wild state it would burrow into the closed-up tip of a shoot.

On May 7th the larva had changed into the second instar, and was in all respects similar to its first instar in appearance : it was unfortunately not measured in this stage owing to my being from home for several days. On May 17th the third instar was reached ; it was then 2 mm. long : the head was black and glabrous, the lobes prominent, the antennae not so noticeable as in the previous instars : the prothoracic plate was dark brown and glabrous : the remainder of the segments and claspers were light green : the prolegs black : the spiracles and tubercles inconspicuous : the larva was very transparent, and without a perceptible anal plate.

On May 27th the 4th instar was reached : the larva was then 3.5 mm. long : the head was jet black and glabrous, the prothoracic plate was dark brown and glabrous : there was no perceptible difference between the appearance of the larva in this and in the last instar.

On June 2nd the larva had entered into the 5th and final instar : it was then 7 mm. long and indistinguishable from the last instar in appearance, except of course for its greater size : four days later it had developed its full-grown characteristics, including the honey-coloured head, and glabrous, green, prothoracic plate, without further change of instar : by June 9th it had increased in length to 14 mm., and then commenced to pupate : the actual pupation was accomplished by June 13th. The change took place in a silken-lined pocket, formed by folding over a portion of a willow leaf. This larva, being one of the small spring brood, was undoubtedly at full growth several millimetres shorter than would be a larva of the autumn brood, or of the single-brooded Scotch race.*

Circumstances did not permit my describing the pupa resulting from this larva. I therefore wrote to Mr. Prout, who was staying in the Lochinver district in July last, for material to enable me to describe a pupa : Mr. Prout very kindly performed this service, which permitted me to make the following description :

The pupa.—Length 9 mm., width 1.75 mm. : the abdominal segments are reddish brown, darkest in the dorsal area : the wing-cases are dark greenish brown : the abdominal segments from 1 to 7 taper gradually and regularly, and the 8th and 9th rapidly, to the anal extremity, the latter terminating in a hook, the point turned ventrally : the segmental divisions are clearly defined : the skin is rough and without noticeable hairs, but each segment is armed with two rows of well-developed spikelets, pointing towards the anal extremity, and also with several hair-like spines : the anal

* The larva invariably feeds in a willow shoot of the year's growth, near the tip, spinning together the terminal leaves : a shoot containing a larva is conspicuous and unmistakable.—W. G. S.

segment is furnished with the usual arrangement of hooks for securing the pupa to the cocoon; the extremity of the wing-case reaches to the centre of the 4th abdominal segment; the head and thoracic segments are smooth and slightly polished; the wing-cases are somewhat striated longitudinally, the covering of the eyes and antennae is inconspicuous; the head is rounded, and is not furnished with a cocoon opener.

In confinement the larva usually pupates in a folded-over portion of a sallow leaf, which it lines with white silk, but in some instances, in confinement, in the folds of the linen or cloth cover of the cage.

In nature one finds pupae in the folded-down leaves of the food-plant, but these in my experience only represent a very small proportion of the whole: I am, however, indebted to Mr. W. Mansbridge for the following information on this point: "A friend of mine, on finding a larva, cuts a long twig of the food-plant spun together by it, and then places his whole gathering of twigs in water, in a very roomy cage, with earthy material at the bottom to sink the water-bottle containing the twigs in: his estimate is that about 90 per cent. of the pupae are amongst the loose material on the surface of the earth, and the remaining 10 per cent. are spun up amongst the leaves." This account corresponds with my own impression, and may, I think, be considered as accurate an estimate as can be arrived at without counting a large number of pupae kept under similar conditions.

(To be continued.)

A NEW GENUS OF TROPIDUCHIDAE (HOMOPTERA) FROM S. AFRICA.

BY W. E. CHINA.

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Turneriola gen. nov.

Vertex produced in front of the eyes, arcuate, nearly twice or more than twice as long as the pronotum in the middle, with the posterior margin obtusangularly cut out, the sides and the middle carinate and the area on each side of the medial carina slightly concave. *Frons* anteriorly tectiform with a strong medial carina, posteriorly rather flat with the medial carina obscure, broadest in the middle, the posterior margin obtusangularly cut out and the sides carinate. *Clypeus* short, triangular, flat on top without a medial carina, the sides somewhat angularly rounded but not carinate. *Genae* coming to a point anteriorly and reaching the apex of the vertex. *Rostrum* reaching the intermediate coxae. *Eyes* somewhat elongate, ocelli absent or obsolete. *Pronotum* more or less tongue-shaped, the anterior margin slightly obtusangularly produced to correspond with the excision of the vertex, the posterior margin strongly and roundly excised, the disc flat with a medial and two lateral

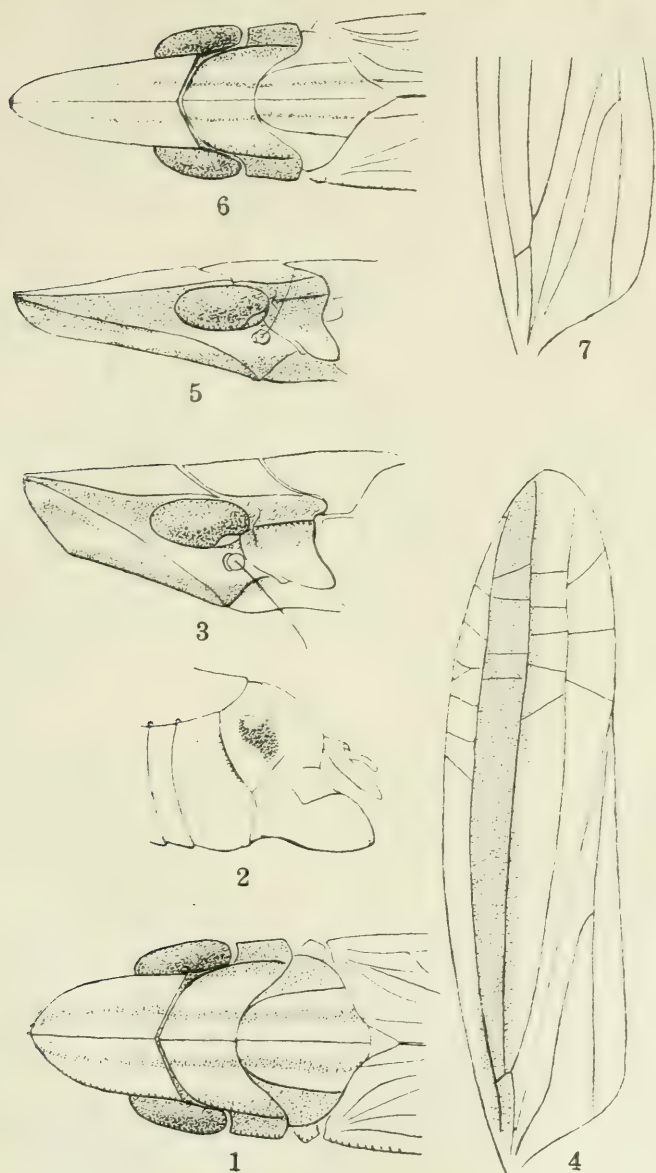
carinae, the sides depressed with their margins carinate. *Mesonotum* longer than the pronotum, more or less convex, the margins slightly sinuate, disc with a medial and two lateral carinae rather obscurely marked, the apex restricted off by a groove or depression. *Tegmina* slightly arched, rather narrow, extending about two-thirds the length of the abdomen in the brachypterous forms, and extending about one-third their length beyond the genital segments in the macropterous forms; all three sectors simple and unbranched and extending to the apex of the tegmen, where there are several obscure and irregular transverse veins; claval veins uniting about the middle of the clavus, the resulting vein joining the claval suture slightly before the apex of the clavus. *Wings* large, whitish hyaline. Posterior tibiae with two spines.

Type: *Turneriola rowlandi* sp. nov.

Near *Conchyoptera* Sign from Madagascar, but differs from that genus by the shape of the frons, which is broadest in the middle and tectiform anteriorly, by the genae which reach the apex of the vertex, by the less arched tegmina with unbranched sectors, by the non-carinate clypeus, etc.

***Turneriola rowlandi* sp. nov.**

♂.—*Vertex* dirty creamy white, with two fairly narrow blood-red stripes running from the apex to the middle of the posterior margin of the area on each side of the medial carina, the surfaces of these areas slightly concave and obscurely transversely rugose; apex of vertex very slightly recurved, showing a little of the dark brown apex of the frons: length in the middle equals breadth between the eyes. *Frons* sparsely covered with rather long fine erect hairs; dirty cream colour, with the marginal carinae in front of the eyes, the medial carina for the anterior third of its length, a crescent-shaped fascia anteriorly and two broad diverging bands running from the medial carina above the middle to the posterior lateral margins, dark sepia brown. *Clypeus* dirty cream colour with two pale sepia brown bands convexly sinuate on the disc, and the anterior lateral angles dark brown. *Genae* in front of the eyes brown, remainder creamy white, except the posterior ventral corners, which bear the continuation of the dark brown diverging bands of the frons. *Eyes* black with a narrow blood-red border on the ventral side. *Antennae* short. *Pronotum* obscurely rugose, dirty creamy white, with the anterior margin and the outer and marginal carinae on each side paler, the lateral margins of the disc within the outer carinae pale brown, the two blood-red stripes of the vertex continued across the disc on each side of the medial carina, the outer carinae in a line with the inner margins of the eyes and the marginal carinae in a line with the outer margins of the eyes, the area between the two carinae dark sepia brown: outer halves of propleura bearing the continuation of the dark brown bands on the genae above the eyes, inner halves whitish. Length of pronotum in middle 0.3 mm., breadth, equals that between the outer margins of the eyes, 1.0 mm. *Mesonotum* creamy white, the three carinae lighter in colour and the margins outside the lateral carinae pale brown, the two blood-red stripes continued across the



T. rowlandi: 1, dorsal view of head and thorax; 2, lateral view of genital segments of ♀; 3, lateral view of head and thorax; 4, tegmen of macropterous form. *T. aliciae*: 5, lateral view of head and thorax; 6, dorsal view of head and thorax; 7, basal part of tegmen.

disc but somewhat broader than on the vertex: length in the middle, including the constricted apex, 0.8 mm. *Tegmina* semi-hyaline, pale creamy brown with the veins paler, the area between the inner and middle sectors slighter darker than the rest, but that between the middle and outer sectors entirely dark brown down to the apex of the tegmen: all three sectors are unbranched and arise from a short narrow basal cell: there are several obscure cross-veins, including seven in the posterior half of the costal area and, in the macropterous form, an oblique one joining the inner sector to the inner margin of the tegmen near the apex, thus giving the inner sector a shortly branched appearance. In the brachypterous form all these cross-veins are practically obsolete. Length of tegmen 3.7 mm. in the macropterous and 2.3 mm. in the brachypterous form. *Wings* large whitish hyaline, veins white. *Abdomen* below dirty yellowish-white, sparsely covered with fine white hairs, first four visible segments marked with dark sepia brown and red, sixth segment with the posterior lateral margin edged with shiny black, seventh visible segment with a large shiny round black spot on each side, which with the rather elongated genital segments gives a grotesque bird's head appearance to the end of the abdomen when held upside down and viewed from the side. The two posterior tibial spines and the crowns of the spines at the apex of the posterior tibiae and tarsal joints tipped with black. Total length of macropterous form including tegmina 5.5 mm., length of brachypterous form 4.5 mm.

Ceres, Cape Province, S. Africa, 1500 ft., Jan., 1921 (R. E. Turner): 2 ♂, one brachypterous, the other macropterous.

T. aliceae sp. nov.

♂. :—*Vertex* longer and narrower than in *T. rowlandi*: pale yellowish brown with the red stripes more or less obsolete; length in the middle 0.9 mm., breadth between the eyes 0.5 mm. *Frons* similar in pilosity and colouring to the preceding species, but narrower and much more flat, the medial carina much less pronounced anteriorly. *Clypeus* and *genae* as in *T. rowlandi*. *Pronotum* yellowish brown, the lateral and marginal carinae paler with the area between them dark sepia brown, the red stripes narrow and obscurely marked; length in the middle 0.4 mm. *Mesonotum* yellowish brown with the carinae rather obscure and the red stripes narrow and indistinct. *Tegmina* semi-hyaline, more or less uniformly yellowish brown with the costal margin paler and the cross-veins very obscure and irregular: the middle and inner sectors arising at the base from a single short stalk from the basal cell; length 3 mm. in the macropterous and 2.5 mm. in the brachypterous form. *Wings* well developed, whitish hyaline. *Abdomen* below covered with fine white hairs: in the female pale yellowish brown marked with darker brown, seventh visible segment with a large round black spot on each side as in *T. rowlandi*; in the male the abdomen is marked with bluish green along the posterior margins of the segments and with dirty red along each side: the black eye spots are absent. Total length of macropterous ♂ including tegmina 5 mm., length of brachypterous 2.5 mm.

A much narrower and more obscurely coloured insect than *T. rowlandi*.

One macropterous ♂ Ceres, Cape Province, S. Africa. 2-21. iii. 1921 (R. E. Turner); one brachypterous ♀ Cape of Good Hope, 1885 (C. Darwin).

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Cromwell Road, S.W. 1.

A NEW *ELIGMA* (LEP. NOCTUIDAE) FROM TANGANYIKA TERRITORY.

By Miss A. E. PROUT, F.E.S.

Eligma bettiana, sp. nov.

Fore wing grey, banded with lemon-yellow, the anterior part deeper grey, except basal third and termen. The yellow band somewhat as in *E. laetepicta* but extending to base at costa (leaving a fine dark line on costa), oblique to M (not to fold) and ending at fold: three nearly straight broad black lines, the first basal, from cell to fold (preceded by three black basal spots), the others from M to hind margin at about a quarter of wing and at a little beyond middle, the latter followed by an angled line from M to SM²; a lemon-yellow patch beyond end of cell, posteriorly rounded, anteriorly straight except for a small protuberance at distal end, the posterior edge defined by broken black lines and spots: five triangular black spots towards termen (between SC⁵ and M²), the anterior pair coalescing: a denate maculate line near termen. *Hind wing* coloured as in *laetepicta*, but with the white on fringe extended to a large apical spot on wing and the black border narrower (especially at costa and inner angle), less angled. *Underside*.—*Hind wing* as above: fore wing nearly as in *laetepicta*, but with the discal yellow dusting much slighter and the proximal edge of the black area much more curved.

Head and thorax brownish-grey; basal joint of antenna and a spot behind it on head glossy-black: tegulae with three triangular black basal spots; thorax with three black spots on each side (the anterior ones on patagia); abdomen and pectus as in *laetepicta*; fore and mid tibia and posterior part of hind tibia grey.

Fore wing with the areole somewhat shorter than in either *narcissus* Cr. (the genotype) or *laetepicta* Oberth. (also figured in Cat. Lep. Phal., xi), and with vein SC⁵ arising nearer to cell: the discocellulars strongly angled inward at fold. Hind wing with the termen hardly excised at discal fold, the anastomosis to scarcely beyond middle of cell. Termen of fore wing slightly more oblique than in *laetepicta*, to which this species appears most nearly allied. Exp. 82 mm.

South-West Tanganyika; Marangu Plateau, west side, 7000 ft., February, 1922 (T. A. Barns), one ♀. Type in Coll. Joicey.

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

BY F. C. BOWDITCH.

(Continued from p. 64.)

Trirhabda ? brasiliensis sp. nov.

Large sized, black: head, thorax and scutellum rufous; elytra thickly and finely punctate, rugose and opaque; lateral and sutural edges narrowly ($\frac{1}{2}$ mm.) yellow.

Type: 2 examples, Rio de Janeiro. Length $6\frac{1}{2}$ mm. (Coll. Bow.).

Head with smooth polished antennal calli; vertex thickly, rugosely punctate, lightly longitudinally impressed; antennae half the length of the body, joint 2 short, 3 nearly half longer, markedly shorter than 4; thorax transverse with a deep cross depression, accentuated by a deep fovea on either side, coarsely punctate and shining on the edges, and finely punctate and opaque in the depression, also slightly depressed in middle, sides rounded; elytra nearly parallel, coxal cavities open, tibiae without spines; claws bifid.

Monocesta subvittata sp. nov.

Form of, but a trifle larger than, *sublimbata* Baly, colour dull red; antennae, except the base, black; thorax slightly darkened across the disk; elytra with faintly indicated sublateral and subsutural dark vitta joined at apex.

Type: 1 example, Rio de Janeiro. Length 6 mm. (Coll. Bow.).

Head with vertex and front, thick rugosely punctate, longitudinally furrowed; antennae reaching the middle of the elytra, 2 basal joints more or less fulvous, 3 and 4 sub-equal; thorax finely rugosely punctate, transverse, with a deep cross depression, foveate at end, also fairly well marked discal depression; elytra robust, slightly dilated behind, very thickly and finely rugosely punctate and covered with sericeous pubescence; this latter semi-obscurer the dark vittate markings; body below and legs dull red; claws bifid. The elytral pattern follows *sanguinicollis* Clk., but that species is larger and has a shining red thorax, whereas *subvittata* is everywhere dull; *rubiginosa* Clk. is much larger and the side vitta distant from the margin.

Monocesta (?) rugicollis sp. nov.

Medium sized, dark brown; thorax sanguineous, with deep transverse and longitudinal grooves with 3 deep foveae; elytra nearly parallel, lighter brown, thickly evenly punctate with short golden pubescence; legs dark, bases of femora rufous.

Type: 6 examples, S. Catherine, 1 Rio Grand de Sul, Brazil. Length $6\frac{1}{2}$ –7 mm. (Coll. Bow.).

Head with antennal calli well defined; front rugose, slightly longitudinally impressed; antennae stout, reaching below the middle of the body; joints 2, 3, 4 gradually increasing in length; thorax transverse, sides rounded subangulate at the middle, surface everywhere rather coarsely rugosely punctate, the depressions deeply and plainly defined in dark colour, the anterior thickened edge divided by a median break; scutel quadrate finely grooved, cavities open, claws bifid.

I am not fully satisfied this species ought to be in *Monocesta*, but at present it seems best to let it rest there.

***Monocesta robusta* sp. nov.**

Medium sized, robust: dark chestnut brown: antennae (except base), tibiae and tarsi black.

Types: 3 examples, Honda, Columbia (2 Jac. Coll.). Length $8\frac{1}{2}$ mm. (Coll. Bow.).

Head with well-marked calli, and transverse impression front and vertex circularly flattened, coarsely, thickly punctate, and slightly concave; antennae stout, reaching the middle of elytra, joints 1, 2 more or less rufous, 3, 4 nearly equal: thorax transverse, sides subangulately rounded about the middle, surface thickly rugosely punctured, with deep side, an apical longitudinal, and sub-basal supplementary transverse, depressions more or less shaded darker; elytra very thickly, rather finely and rugosely punctate, the entire upper surface with more or less golden pubescence; claws bifid.

The form and size is about similar to *rubiginosa* Clk.

***Monocesta tarsalis* sp. nov.**

Medium sized: dark brown with antennae and apex of tibiae and tarsi black or much darker than rest of body.

Type: 2 ♂, 1 ♀, Paraguay (Dr. Bohis), also 2 ♀ Argentine (Bruch) (Coll. Bow.).

Head with well-developed shining antennal calli and with longitudinal impressed line; vertex rugosely punctate, in a semicircular space; antennae widely separated at the base reaching below the middle of the elytra (♂); joints 2, 3, 4 gradually increasing (♂), 3 slightly longer than 4 (♀); thorax transverse, sides subangulately rounded at middle ♂, less so in ♀, broadly transversely depressed ♂, less marked and raised in the middle ♀; scutel quadrate; elytra nearly parallel ♂, dilated behind the middle ♀, both thorax and elytra (the latter more strongly) thickly rugosely punctate and rather sparsely clothed with yellow pubescence; hind tibia of ♂ distinctly dilated at the apical third within, and furnished with a finely serrate carina; ♀ tibia simple; the dilation of the tibia recalls some of the species of *Colaspis*.

***Monocesta parallela* sp. nov.**

Medium sized, elongate parallel, entirely light, dull, yellow, except the antennae are darkened towards the tip, also the last joint of the tarsi as well as the claws are dark.

Type: 3 examples, Argentine Gob. Misiones (Bruch). Length 7-7½ mm. (Coll. Bow.).

Head with deep, well-marked transverse depression between the eyes, deeply foveate just behind, vertex finely, rugosely punctate; antennae reaching the middle of the elytra, joint 2 short, 3 a little longer $\frac{5}{4}$, more so in $\frac{4}{3}$, 4, 5 longer and equal; thorax transverse, sides slightly rounded, narrowed at the front, broadly transversely depressed and also longitudinally down the middle, surface very finely punctulate; elytra parallel, obsoletely depressed below the shoulder, finely and thickly punctulate and with traces of obsolete costae, entire upper surface sericeous with short pubescence.

The uniform colour and long body will aid in separating this form.

(To be continued.)

NOTES AND OBSERVATIONS.

AUXIMOBASIS NORMALIS, MEYR.: A TINEID MOTH NEW TO BRITAIN.—In September, 1921, I took a small moth on the dock wall at Liverpool, which has recently been determined by Mr. Edward Meyrick as the *Blastobasis*, *Auximobasis normalis*. At the time of capture I thought the moth was *Sitotroga cerealella*, which it resembles in colour and size, and which I was looking out for; it was resting in a joint of the brickwork—a situation much favoured by *cerealella*. Closer examination, however, showed my capture to be something new to me, and I sent the specimen to Mr. Meyrick, who identified it and supplied the following particulars:

The genus *Auximobasis*, of which twenty-five species are known, is wholly American, North and South: *normalis* is known from Ecuador and Colombia; the larval habits in the genus are similar to those of *Blastobasis*, but are not known for this particular species. We must in this case regard the insect as a casual, although it may be breeding in some of the warehouses which line the docks at Liverpool.

It is curious, though quite natural, that a number of moths known to be abundant inside the Liverpool warehouses are not commonly found outside except in very warm summers. I have, for instance, found *Corecya cephalonica* swarming inside a warehouse when careful search outside failed to reveal a single specimen.—WM. MANSBRIDGE; Dunraven, Church Road, Wavertree, Liverpool.

ZOOLOGICAL RECORD.—The attention of Entomologists throughout the world is called to the fact that, beginning with the volume for 1922, the preparation of the *Insecta* part of the *Zoological Record* is being undertaken by the Imperial Bureau of Entomology. In order that the Record may be as complete as it is possible to make it, all authors of entomological papers, especially of a systematic nature, are requested to send separate of their papers to the Bureau. These are particularly desired in cases in which the original journal is one that is not primarily devoted to entomology. All separata should be addressed to The Assistant Director, Imperial Bureau of Entomology, 41, Queen's Gate, London, S.W. 7, England.

EARLY SPRING NOTES.—On February 26th, a mild sunny day, larvæ of *Melitaea aurinia* (in the open) were observed sunning outside their winter webs, and a number were already feeding. The willows are in bloom in many localities. Several *V. urticae* were seen on the wing on March 3rd.—THOMAS GREER; Curglasson, Stewartstown, March 6th, 1923.

SCARCITY OF *SPILOSOMA LUBRICIPEDA* AND *S. MENTHASTRI*.—Reading the December issue of the *Entomologist*, I have been struck by your correspondents' remarks relative to the above species. Please permit me to add something to the credit side of the account by stating that I have observed these insects in West and Mid-Hertfordshire for many years, and am not aware of any apparent diminution in their numbers. I see them every season in fair abundance and, in the districts named, *S. menthastri* is the better distributed and more frequently met with. There is an area of natural scrub in West Herts of some extent and every year this yields *S. lubricipeda*. My own experience is that the latter species comes very freely to light.—ERNEST W. NIMMY, F.E.S.; 210, Whippendell Road, Watford, February 22nd, 1923.

PORTHESIA CHRYSORRHOEA.—In the March *Entomologist* Mr. Adkin asks for information about the above insect. I was at Littlestone in August, 1919, and found on what I believe are clumps of Sea Buckthorn enormous numbers of nests containing pupæ of the Brown-tail Moth. The bushes were stripped bare of leaves, and the white wings of the insects could be seen glistening in the sun all over the clumps. I was again at the same place in August last year; old nests were to be seen everywhere, but I failed to find a pupa, and only found one moth clinging to a grass stem. It would appear therefore that the scarcity of this insect was not confined to Eastbourne last year. The insect seems to congregate in restricted areas, and would soon kill its food-plant if it were not practically wiped out at frequent intervals. The same sort of thing happens in other stations in life; the rabbits in Canada reach a maximum when almost every bush contains one, and then one might almost say in the twinkling of an eye they are wiped off the face of the earth, so that the following year scarce one can be found. The lynx increase as the rabbits increase, and then die of starvation when their main support disappears. To me the strange thing is that these colonies of *P. chrysorrhoea*, widely separated and restricted as they are, should owe their fall to disease probably caused by a parasite, instead of to

the fact that they have devastated their food-plant; and that the first cause should wipe them out in a certain year, and not, as one might expect, at different times. The parasite no doubt follows the fortunes of its host, and rises and falls with it, and thus the *chrysorrhoea* survivors are able to start afresh with little to contend against.—FREDERICK GILLET, Major; Cheriton House, Sevenoaks, Kent.

KILLING WITH CYANIDE.—With reference to Mr. F. W. Frohawk's useful comment (*Ent.*, lv, Dec., p. 280) on my note of the previous month (*l. c.*, p. 260), I would like to make it clear that it was not my intention to recommend cyanide as a relaxing agent; but rather to show how very easy it is to avoid the somewhat common habit of using it as such without sacrificing in any way the perfection of relaxation which the continued exposure to the cyanide fumes undoubtedly gives.

Leaving an insect in a bottle until the rigor disappears is not, of course, a new idea. My own experience has shown it to be an apparently safe course with the great majority of moths, but much less so with the generality of butterflies. And although it provides one means of obtaining absolute relaxation, and is a legitimate method if not abused, it is, nevertheless, expensive, cumbersome and inconvenient if more than a few insects are being handled; and on that account alone will be shunned by a busy collector.

But my main argument was to show that neither is it necessary to expose a cyanide-killed specimen to the fumes of the laurel-leaf relaxing tin, or even to the damp atmosphere of the ordinary zinc box, in order to bring about that condition of complete flexibility which is demanded by a fastidious setter.

In penning my first short note I had in mind the experienced collector—one familiar with the ordinary manifestations of cyanide—and I was not attempting to deal exhaustively with the subject of cyanide killing. But Mr. Frohawk's timely warning reminds me that, in extolling the merits of cyanide as one of the best killing agents, I ought also to have referred, however briefly, to its dangers. This for the benefit of the beginner, who has yet his experience to buy, and who, very probably, has not had an opportunity of reading the several discussions on the subject of killing which have appeared from time to time (though not, I think, lately) in the pages of this and kindred journals.

As Mr. Frohawk truly points out, cyanide is not too safe a killing agent for everything, although, all told, the defaulters are not numerous—far less so than is the case with ammonia. Moreover, I am inclined to believe that some (nearly all, perhaps) of the known objectors might be safely killed with cyanide so long as they are exposed to its action only for the comparatively short time necessary to ensure death—say half-an-hour.

It seems to me that in almost every case it is the *continued* exposure that is injurious, and it is just this continued exposure that my suggested method renders unnecessary. For I pointed out that the relaxation of a cyanide-killed insect occurs spontaneously and requires no assistance, only *time*: neither is it accelerated in the slightest either by leaving the specimen in the bottle, or by

putting it, as is perhaps even more commonly done, into a special relaxing-tin.

Of *C. hyale* I have had no experience, and it is now more than twenty years since I caught my *C. edusa*. The latter were certainly killed with cyanide and, I believe, would be left in the bottle. *G. rhamni*, however, and *C. pamphilus* were soon placed on my black-list, and gradually I came to discard cyanide for all butterflies in favour of oxalic acid. This I have used almost exclusively for the Rhopalocera for a good many years. During the past season, however, I have revived the old interest in cyanide, and although now, I regret to say, my health will not permit me to hunt, I have had a fair amount of material brought in by many kind entomological friends.

The Whites, *Pieris brassicae* and *P. rapae*, will turn yellow if left too long in the cyanide bottle. *Melanargia galatea* is also affected. The white of *Spilosoma menthastri* and the pure white of female *S. mendica* turn to cream: the delicate green of *A. aprilina* becomes a dirty yellow. But worst of all is the lovely green of *Hylophila prasinana*, for in this case the destruction of colour is, I believe, immediate, and I doubt whether cyanide could be used in any way for this particular species.

But oxalic acid is not without its drawbacks, and although it does not, so far as my experience goes, alter any colours, it produces a rigor as bad as, or even worse than, that of cyanide. After a full dose the specimen must be set right away. And if the dose is reduced, with the idea of dodging the rigor, the insect may, later, be found alive and kicking on the board. Moreover, pricking calls for considerable manipulatory skill if one would avoid mutilating and mauling the victim. It is a delicate and somewhat tedious operation even at best, when surrounded by the usual home conveniences; but in the field or in the woods on a blazing summer's day, with a thousand flies buzzing around one's head and a murderous "cleg" waiting to pounce on the back of one's neck so soon as one sits down, it is no joke! Therefore, I would like to see the handy cyanide bottle restored to favour, and made as safe for butterflies as it is for moths, if any improvement in our mode of using it can make it so.

The late Mr. J. W. Tutt condemned cyanide because he found that it necessitated keeping the insects a week longer on the setting-boards. This was due, I believe, to his method of using it, viz. attempting to set the specimen as soon as it was dead. Many collectors try to anticipate the rigor in this way with insects they breed or bring home alive, but I have never been able to consider it a good method. For after even half-an-hour's exposure in the bottle (the bare safe minimum for the bulk of things) a certain amount of rigidity is apparent—far too much for really good and rapid setting. And although the specimen may then be set, the rigor will still carry on for the full time, and will be followed by the inevitable period of relaxation. Which means that the insect is occupying valuable board-space under false pretences, for it does not begin to dry, really, until the fifth or sixth day!

Far more practical, from the point of view of good setting, too, is

the everyday method of allowing one's captures to soften thoroughly in the relaxing box, or even, when it is safe to do so, in the bottle itself, with all the attendant risks of either course: but better still, I maintain, is the simple "rest cure" I have suggested, in a clean dry tin, for that treatment is accompanied by no risks at all.

As a supplement to my former note, I would say that just recently I made a further test with a specimen of *Agrotis saucia*, one of a nice batch of 50 that have emerged in the forcing cage. This moth is one, of course, that I would, ordinarily, kill with ammonia. However, I despatched this individual with cyanide on Saturday morning and left it in the bottle just over half-an-hour. Even then I found it too stiff and rigid for convenient setting, and I pinned it into a corked, dry, tin box and put it away to "rest" in a cupboard in my sitting-room. (I prefer to pin all resting insects because the pin makes such a useful handle later when one picks out a specimen for examination: but the pinning is better done as soon as the insect ceases to move, before any rigor has gripped it. By following this course one avoids breaking off a leg, perhaps.) By Sunday evening, about 30 hours later, I found it sufficiently relaxed to have been set comfortably, but still not at its best. By Monday morning, however (2 days), it was delightfully soft and flexible—indistinguishable, in fact, from those I had killed with ammonia. And it remained in this flaccid condition until Monday evening; and this, be it noted, in a room where a fire was burning, and without the aid of damp or of any relaxing material whatever.

Such ample latitude makes it almost impossible to put away a specimen and forget it. But I give the average entomologist credit for a reasonable amount of method in his work: and the busier he may be, the more method he will have!

I do not wish any reader to infer that I place no value on the laurel-leaf relaxing box. On the contrary, I consider it one of the most useful items of the collector's outfit. But it is not necessary for the relaxation of an insect that has been killed in the cyanide-bottle. Its principal use, with me, is to preserve the relaxation (spontaneously produced) until such time as it is convenient to set one's specimens. And this it will do, for weeks if necessary, with many of the moths, but caution must be exercised when entrusting butterflies to its action. Furthermore, for the relaxing of old insects, I do not think laurel leaves, or the ready-made mixture from a laurel base supplied by one enterprising dealer, can be equalled.—FRANK LITTLEWOOD; 22, Highgate, Kendal, December 13th, 1922.

"WINDOW" ENVELOPES.—The usefulness of what stationers call window envelopes for unset specimens of Rhopalocera and Heterocera may not be generally known. It had not occurred to me until I received from Perak some time ago a consignment of butterflies in which used envelopes of this description, that had done their duty in the post, were pressed into service. The ordinary envelope in commercial use, such as these were, has, however, a window that is insufficiently transparent for details in the colours and markings of an enclosed specimen to be clearly recognised: and a search for something better put me on the track of Messrs. Kenrick & Jefferson, of West Bromwich, who

supply a "Clearsight" envelope, measuring $6'' \times 3\frac{1}{2}''$, in which the window is actually as transparent as glass. The convenience of such an envelope is obvious, for it will hold from one specimen of the large *Papilios* to three or four specimens of the moderate-sized *Nymphalids*, with perfect protection and perfect visibility over a considerable area of the underside of each specimen. By this means the identity and condition of a specimen enclosed can be seen at a glance, without the trouble and risk attached to opening the old-fashioned triangular envelope. A further advantage comes from the availability of the paper upper portion of the envelope for the entering of name, locality and other notes, and by writing these in pencil each envelope can be used over and over again as required. I have found it a very convenient plan to clip together, with the wire clips also sold by stationers, envelopes containing the same species, and to have made for storage strong cardboard boxes in which numbers of the envelopes can stand in any order desired. If names are written in one of the top corners of each envelope, or batch of envelopes clipped together, any particular species can be picked out as readily as a particular card can be turned up in a card index. Boxes for this purpose should be made slightly wider and deeper than the envelopes used, to ensure easy insertion and withdrawal. For the envelopes mentioned above a width of $6\frac{1}{2}''$ and a depth of $4\frac{1}{4}''$ prove quite comfortable. As to cost, I may add that the price of these "Clearsight" envelopes is 18/9 per single thousand, or 16/3 per thousand on an order for 6000. Entirely suitable and smart-looking cardboard boxes $16'' \times 6\frac{1}{2}'' \times 4\frac{1}{4}''$ have been made to special order by a local bookbinder at 8/- per dozen. A deeper envelope of the same style is also supplied by Messrs. Kenrick & Jefferson, but the commercial envelope referred to will be found to take anything except the very large *Morphos*, *Papilios*, and *Saturniids*. They are not suitable for the smaller fry, such as the *Lycaenids*, for which a satisfactory envelope would have to be specially made.—H. B. BROWNE, M.A., F.E.S.; Kenilworth, Morley, Yorks.

THE HORNE COLLECTION.—The second portion of the collection of British Lepidoptera formed by the late Arthur Horne of Aberdeen came under the hammer at Stevens' Auction Rooms on February 20th last. It comprised the Sphinges and Bombyces and a considerable portion of the Noctuae, together with a few lots of Rhopalocera held over from the former sale. The general excellence of the specimens was well maintained, and although some few lots did not make very high prices, as for instance one of 177 *Apamea didyma* (*oculea*) with 41 *A. leucostigma* (*fibrosa*) for 10s. and 135 Scotch and English forms of *Taeniocampa gothica* for 12s., the majority found ready buyers. Indeed the lowest price obtained for any one lot was 8s. and this was exceptional, a pound or two being quite the usual thing for a lot of anything but the commonest species. Among the more interesting lots was one of five *Mimas tiliae*, all unusual forms, and one of them a unicolorous buff specimen which sold for 2 guineas; and another of ten *Amorpha populi*, which included a deep sage-green specimen and other nice forms, which made £4. This specimen, we believe, was sold in the Maddison Collection

in 1909 with a rosey variety for 4 guineas. A lot of six *Manduca atropos*, which included one specimen without the thoracic mark and another with a streak in right fore wing, made £2; one of twelve *Herse convolvuli* a like amount; and one of twenty *Smerinthus ocellatus*, including one specimen with obsolete ocelli, £3 5s. Hybrid *S. ocellatus* × *A. populi* in lots of four sold at 26s. to 32s. 6d. per lot. A lot of two *Hyloicus pinastri* and one *Hyles euphorbiae* made 35s.; and two, each of one *Hippotion celerio* and two *Phryxus livornica*, 24s. and 40s. per lot respectively. A lot of eleven *Deilephila galii* made £4 10s. and another similar 42s. *Daphnis nerii* in a lot with six *Sphinx ligustri* was knocked down for 25s., and a couple of suffused *S. ligustri* for 32s. 6d. *Zygænas* appeared to be in request, a lot of nine *Z. achilleæ* and fifty-seven *Z. trifolii* including two "black" specimens made £4 15s.; one of nine *Z. trifolii*, which included three black, two yellow and a pink £5 10s.; and another of ninety-two in which were three black and sundry other forms, £6 5s. A lot of eighty-six *Z. lonicerae*, which included one specimen all red except the margins and sundry others with spots very small or confluent, was not dear at £3 15s. Seven *Z. filipendulae*, three black and four more or less yellow forms, made £3 10s.; six, being four orange, one bronzy and one smoky-black, a like amount; and eight, consisting of two with all spots confluent, one "five-spotted" form and five others, 63s. *Nola centonalis* sold in lots of six each brought 20s. to 30s. per lot. A series of thirteen *Senta irrorella* offered in one lot included a specimen resembling the streaked Continental mountain form *andereggi* but somewhat smaller in size: it was from the Farn Collection, and is labelled, "Scotland, 1868: Mr. Doubleday knew of this and one other"; the lot made 40s. *Oenistis quadra*, a female without spots in a lot of three, went for 50s., and a series of twenty-five beautifully marked *Cascinia cribrum* for 45s. The *Deiopeia pulchella* were put up in couples, and made from 16s. to 42s. per lot according to their condition and credentials. A lot of two *Euchelia jacobææ*, consisting of a yellow specimen and one with blackish hind wings, sold for 65s., another of one very black variety and one with light grey fore wings for 60s.; one of five including one with greyish hind wings and other forms 15s.; one of eight including two yellow varieties 50s.; one of eleven including one with yellow hind wings, two pink forms and one with apical spots united 40s.; and one of thirteen in which there were two specimens with all the spots and costal streak united 50s. A very beautiful Aberdeenshire *Parasemia plantaginis* male of a rich black with yellow basal spots ran up to £13 13s.; a lot consisting of an exceptionally light specimen and a very dark one made 70s.; and one of thirty-one that included eleven var. *hospita* 60s. A *Callimorpha dominula* wholly black except for white dots at the angles of fore wings made £6 10s.; one entirely black £5 10s.—just double the price that it made at Farn's sale; and a lot of two consisting of a lightish variety and a var. *persona* £4 10s.; this latter, we believe, was one of two bred by Maddison, which at his sale made 10s. and 32s. 6d. respectively. The best *Arctia villica* was one with wings creamy-yellow with narrow black costal and outer margins, and it ran up to 13 guineas as against 20 given for it at Farn's sale; a lot of six

which included two with large white apical blotches and two with smoky hind wings made £5 10s. and one with very dark fore wings with a light one 55s. There were a remarkable lot of varieties of *A. caia*, and the highest price given for any one of them was £10 for a practically all blackish-brown specimen bred in July, 1922. Others of interest were one of a unicolorous dark brown which made £6; one creamy-white with red hind wings also £6; another pale one of Worcester origin £8—a pound less than was given for it at Farn's sale; an exceptionally dark one £7 as against £4 15s. at Mason's sale; an almost completely brown one £6 10s.; an entirely brown £8; one with apex of fore wings broadly white with one clouded with brown £5 5s., and so forth. An interesting lot of *Diacrisia mendica* consisted of a female with broad black streaks from the base to beyond the middle of the fore wings, of Irish parentage, one with black cilia to all the wings, one with heavily spotted margins and two others which made £5 10s. for the lot of five. A lot of three *D. menthastri* which included one with transverse bands instead of spots, a strongly rayed specimen of a brownish colour and one exceptionally heavily spotted sold for £5; one of thirty-eight ranging from almost spotless to streaked forms £6; and two, each of fifty-four specimens chiefly of the brown Scotch forms, £5 and £5 5s. respectively; while the whole series of 199 *D. lubricipeda*, which included many nice forms of the *zatima* strain and others, also made 5 guineas. *Laelia cenosa* put up in lots of three sold at from 16s. to 30s. per lot. A lot of forty-nine *Dasychira fascelina* in which were included dark bordered, asymmetrical and whitish varieties made £5; one of seventy-five varied forms of *Malacosoma neustria* 50s.; one of three *Bombyx quercus*, one specimen being smoky, one pale and one broadly bordered 63s.; one of five, one specimen being unusually dark with yellow disc of fore wings also 63s.; one of thirty var. *callunae* £4; and one of four extreme forms of *Odonestis politoria* 40s. Two lots of four each of *Lasiocampa illicifolia* sold for 75s. per lot, while three others each having a pair of *L. illicifolia* included with other species made 60s., 70s. and 70s. respectively. *Drepana harpagula (sicula)* in lots of four realised from 50s. to 60s. per lot. A series of nine *Acronycta strigosa* made 24s. and another of ten 25s.; one of twelve *Bryophila impar* 55s.; a lot of fourteen *Senta maritima (ulcae)* with others 60s.; one of twenty-five *Nonagria arundineta*, four *N. neurica* and others 70s., and one of seventeen *N. sparganii* with *N. cannae* and *N. geminipuncta* 50s. The four *Hydrilla palustris* sold singly at 40s., 25s., 21s. and 21s. each. Thirteen *Noctua subrosea* made from £4 10s. to £5 10s. each for the best and from 30s. to 63s. for the others. A lot described as "*Polia* or *Cloantha* sp. ? ♂ and ♀, Aberdeenshire," but which was really a pair of very good varieties of *Polia chi*, was probably not dear at 21s.; and another catalogued as "*crassa*, near Dover, 1873, *spinifera*, Gregson Coll., *satura*, Burachie, 1896," may have been worth the 60s. paid for it; but what sent the solitary *Phoberia lunaris*, "Brighton, McArthur, Burney Coll." up to £11 we are at a loss to understand; there were two of them in Burney's sale in 1893 and the lots in which they were included realised 6s. and 8s. respectively. The series of *Pachnobia hyperborea (alpina)* was a very fine one and was put up in twelve

lots of nineteen or twenty specimens each; all of them contained some nice forms and were sold at prices ranging between 55s. and 75s. per lot. Two lots of *Orthosia ocellaris* of twelve each made 40s. and 60s. respectively, while two others, which included the one twelve and the other eleven of this species with others, each made 55s.; a lot consisting of twenty-three *Conistra rubiginea*, twenty-four *Dicycla oo* and others 70s.; another of twenty-four *D. oo*, twenty-five *O. xerampelina* with others 45s.; and a fine lot of 106 Shetland *Dianthocia nana (conspersa)* 65s. The lot of three *Nomiades semiargus (acis)* that was included in the sale made 65s., and the eight *Chrysophanus dispar* from £9 to £12 for the fine specimens, and for the less perfect, 55s., 70s. and £6 10s. each. The forty-drawer cabinet with book-case over was knocked down for £31 10s. and the total of the day's sale just exceeded £880.

R. A.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, February 7th, 1923. Mr. E. E. Green, F.Z.S., President, in the Chair. — *Nomination of Vice-Presidents.*—The President announced that he had nominated Mr. J. E. Collin, Professor E. B. Poulton, F.R.S., and Lord Rothschild, F.R.S., as Vice-Presidents for the ensuing year. — *Election of Fellows.*—The following were elected Fellows of the Society: Mr. G. D. Millward, 32, Moorgate, E.C. 2; Mr. Harold Wilkinson, Reindeer Hotel, Burnley, Lancs; Mr. J. D. Dean, 20, St. Fagan's Road, Ely, Cardiff. — *Exhibitions.*—Capt. K. J. Hayward exhibited an interesting series of *Danaüs chrysippus* from Upper Egypt, and also a melanic aberration of *Polygonia c-album*. — Mr. H. Donisthorpe brought for exhibition living examples of *Acanthomyops brunneus* Latr., an ant new to the British list.—Dr. F. A. Dixey, F.R.S., exhibited a little known Pierine from Fiji and a specimen of *Euchloe ausonia egyptiaca* from Western Egypt.—Prof. E. B. Poulton, F.R.S., exhibited a dragonfly, *Aciagrion occidentale*, taken at sea 60 miles west of Colombo. He also exhibited some specimens as evidence of colour adjustments in the wild pupae *Pieris rapae*, and made further observations on the protective resemblance of *Polygonia c-album*, and the attacks of enemies on British butterflies. He further exhibited some remarkable "all-female" families of *Hypolimnas bolina* L., bred in Fiji by Mr. H. W. Simmonds.—Mr. H. J. Turner exhibited a short series of *Argynnis atossa* Edw. from South California.—Dr. K. Jordan, F.R.S., exhibited some specimens of Geometrids, and pointed out that the insect known as *Anaitis plagata* consists of two species, the true *A. plagata* L., and the smaller and paler *A. efformata* Gn., both species occurring in Britain, whereas only *A. efformata* is found south of the Mediterranean and in Southern Spain and Portugal.—Mr. C. L. Withycombe, who illustrated his remarks with lantern-slides, gave some particulars of three genera of Nymphalidae and their larvæ.—S. A. NEAVE, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*February 8th, 1923.*—Mr. E. G. Bunnett, M.A., F.E.S., Vice-President, in the Chair.—Mr. R. W. Fawthorpe, 2, Westover Road, Wandsworth, S.W. 18, was elected a member.—Mr. Frohawk exhibited a coloured drawing of *Pyrameis cardui* in a setting of flowers and leaves; Mr. A. E. Tonge, a series of *Colias croceus* (*edusa*) bred in November last from ova laid in September; there was little variation shown, only one male had a paler ground; Mr. A. A. W. Buckstone, series of normal *Oporinia* (*Oporabia*) *autumnaria* and *E. filigrammaria*, a series of hybrids of the two species, the results of two pairings of the hybrids, and the further results of two pairings of these last. The hybrids were mostly intermediate, but the specimens the result of the last pairings closely resembled *autumnaria*; Mr. A. W. Mera, series of *O. (O.) christyi* from Chalfont Road, and of a melanic race of *O. (O.) autumnaria* from Middlesborough, and remarked that they were very closely allied species: Capt. Crocker, a long series of *Coenonympha pamphilus* illustrating the range of variation in ground colour, spotting, marginal markings, suffusion, etc.; Mr. K. G. Blair, two forms of *Anaitis plagiata*, which Dr. Jordan had just shown were morphologically two species, and stated that nothing was yet known of the larval differentiation; Mr. Cheeseman, a beetle in timber, from Riga, disclosed on cutting; Mr. A. W. Andrews, flower-heads of an Umbellifer with numerous Anthomyid flies entrapped by their proboscis; Mr. S. Blenkarn, species of local and rare Coleoptera including *Lycoperdina succincta* from Mildenhall, *Ocyopus pedator* from Box Hill, *Rhagonycha unicolor* (*translucida*) from Box Hill, *Sphodrus leucophthalmus* from a corn-shop in Woolwich, *Anchomenus 4-punctatus* from Cawthorne, etc.; Dr. James Waterston read a paper with lantern illustrations entitled the "Natural History of St. Kilda."

February 22nd, 1923.—Mr. N. D. Riley, F.Z.S., F.E.S., President, in the Chair.—Mr. L. W. Newman exhibited series of *Charaëas graminis* from heavily marked to almost devoid of markings, *Noctua depuncta* var. *maddisoni*, a red *Dianthoccia carpophaga*, 2 ♀ *N. subrosea*, and a *Chrysophanus dispar*, all from the Horne Collection; Mr. Grosvenor, some *Zygaena stoechadis*, which were a transition to *Z. filipendulae*; Mr. A. A. W. Buckstone, a series of *Anaitis plagiata*, and pointed out the newly differentiated species of *A. efformata* among them; Mr. Enefer, a very large centipede and a large cockroach found in some cases of pineapples from Singapore unloaded at a Bermondsey wharf; Mr. Blenkarn, the local beetle *Lebia chlorocephala* from Otford, Kent; the rest of the exhibits were lantern-slides shown by Messrs. Main, Frisby, Dennis, Bunnett and Dods.—HY. J. TURNER, *Hon. Editor of Proceedings.*

LONDON NATURAL HISTORY SOCIETY.—*February 6th, 1923.*—Mr. E. B. Bishop, President, in the Chair.—Foreign Lepidoptera were exhibited by Mr. C. Smith with a selection of brightly coloured examples from Switzerland, and by Mr. Collenette, who showed Malayan and Javan butterflies.—Mr. Riches exhibited a fine bred collection of *Colias croceus*, and Mr. C. H. Williams a series of *Lycaena coridon*, including a dark leaden-coloured or black variety.—

Mr. Mera showed three species of *Tephrosia* tending to melanic forms, and some hybrids between *T. bistortata*, ♂, from Epping Forest, and *T. crepuscularia*, ♀, from Crawley Down, Sussex. — Mr. Shaw exhibited a finely marked aberration of *Brenthis selene* from Forest Row last June, showing a heavily suffused upper surface and having the underside marked with elongated silver spots. Mr. Burkill exhibited a series of Eriophyid galls, some of them being fresh additions to the British list when found in 1922. There were large numbers of other exhibits of interest to students in other branches of natural history.—H. J. BURKILL, *Minuting Secretary*.

OBITUARY.

PERCY CHARLES REID, J.P., of Feering Bury, Kelvedon, Essex, passed to his rest on the 15th of January last, at the age of 65. After leaving Harrow he went to Sandhurst, and from there to India, serving with the 15th Hussars. He resigned his commission some few years later to join the firm of Pryor, Reid & Co., brewers, of Hatfield, of which he was Managing Director until its sale a short time ago. County magnate, landowner, and a leading agriculturist, Percy Reid yet found time to devote to public work. A fearless rider, an extensive traveller and big game hunter in India, Cashmere, Thibet, America, and Central and South Africa, he was accompanied by his wife on many of his excursions. His fine collection of heads bears silent testimony to his prowess in the field, and his unpublished diaries record every happening. Active, strenuous and indefatigable, if Percy Reid was one of a party that party was sure of success, for he was a born leader, and had an unerring sense of direction and an intuitive instinct that invariably led him straight to his goal. As was to be expected, he was very thorough in his entomological work. He had but few correspondents apart from his friends, for he never exchanged or bought but collected for the pure love of the thing, and no specimen found its way into his cabinet which he had not taken himself, but he freely gave both insects and any information he had that would help a brother entomologist. His energies were exclusively confined to the moths (Macros), of which he had a very fine collection. He frequently proved that many old, almost forgotten records will still yield a harvest to the worker. One example will suffice. He found no difficulty in taking the larvae of *Eupithecia consignata* at a time when it was generally believed to be unobtainable except from a particular strain very carefully fostered. His contributions to the *Entomologist* were principally records of his captures from time to time, and were concise and to the point. He leaves a wife and daughter, to whom we offer our sympathy. His elder son, Capt. H. E. Reid, died of cholera just before the war, while serving in India, and his younger son, Capt. G. P. W. Reid, was killed in action in France. The better one knew Percy Reid the better one liked him, and we who had the privilege of his friendship feel a sense of loss now that he has crossed the Great Divide. May he have good hunting.

J. P.

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THE DISTRESS OF RUSSIAN ENTOMOLOGISTS.

At a recent meeting of the Entomological Society of London, the sum of 20 dollars was voted by the Society, and another 20 dollars subscribed among the Fellows, to send a remittance of food and clothing to the President of the Russian Entomological Society, Andrei Petrovich Semenov-Tian-Shansky, Hon. F.E.S., who is living under distressful conditions in Petrograd; yet in spite of this, and of his rapidly failing eyesight, he is continuing to carry on his entomological work.

The Russian Entomological Society, under his guidance and encouraged by his devotion and enthusiasm, is also carrying on its labours; in the face of innumerable difficulties the members have succeeded in producing their Review, copies of which have reached England. The splendid work done by this school of Entomologists is, perhaps, not well enough known in Britain, except to specialists, but it is almost to them alone that we owe our present knowledge, which is considerable, of the immensely rich, interesting and important fauna of Central Asia, Siberia and the Caucasus. Yet these men can scarcely keep body and soul together, and many have families to support, while few can buy the clothing which is urgently needed. This state of affairs must seriously prejudice the efficiency of their scientific work and thus hinder the progress of Entomology.

In order to help them, a small committee has been formed, with the object of collecting funds and remitting them to the Russian Entomological Society, to be employed as their Council thinks fit, in aiding the members in need either with food or clothing. Moderate sums of money can now be remitted to Petrograd or Moscow. This committee consists of Mr. Arthur Dicksee, Mr. B. P. Uvarov, at the Natural History Museum, and Dr. Burr. Any sympathiser is requested to communicate with either of these, preferably enclosing a remittance, however small, for a few shillings will to-day buy millions of roubles, and will help a Russian colleague to carry on the struggle and his scientific work for the benefit of the Science which we all love.

All British Entomologists who enjoy happier conditions cannot but feel the greatest sympathy for their Russian brethren under these pitiable circumstances, especially those who have connections by correspondence, friendship, or scientific relationship, above all, those who have at any time enjoyed the famous and lavish hospitality of that generous people, and probably many will welcome an opportunity of contributing to their assistance, to help them tide over until better days.

ARTHUR DICKSEE, 7, Duke Street, St. James's, S.W. 1.

B. P. UVAROV, Natural History Museum, Cromwell Road, S.W. 7.

MALCOLM BURR, United University Club, Pall Mall East, S.W. 1.

24th March, 1923.

ENTOM.—MAY, 1923.

L

PERONEA HASTIANA, L. : ITS DISTRIBUTION, HABITS,
LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(With Plate 2.)

(Continued from p. 81.)

VARIATION OF THE IMAGO.

It is when one begins to study the variation of the imago that the difficult part of one's task is reached : the range of variation is quite as great in *P. hastiana* as in *P. cristana*, but in the latter species the forms are very distinct, and there are few intermediates ; whereas in *hastiana* there are almost all degrees of intermediates between many of the forms, so much so that in some instances it is hardly possible to decide to which of two forms certain specimens belong : and then the number of examples obviously related to a particular form, but differing from it in some respects, is extremely numerous, and in certain instances more numerous than those that conform to the description of the form itself, as defined by the type specimen, or the original description. One may first arrange a number of specimens into series, each having certain characters, enabling them to be called A, B, and C ; then if one takes a specimen and compares it with the three series, it is often doubtful which it should be placed with, for it will be found to have some features that are characteristic of A, some of B, and some of C. A number of the forms are abundantly distinct, with very few intermediates, but others present a most difficult problem to classify their variation, and to decide what characters are sufficient to constitute a form, and in some cases to find fixed characters at all.

The present chaotic arrangements of series in collections bear eloquent testimony that this difficulty exists, and doubtless are the reason why the problem has not hitherto been tackled ; without doubt Clark was prevented from dealing with the variation for this reason, for his paper on *P. cristana* variation was published in 1901, and he lived and enjoyed good health for seven years afterwards.

Intermediate and unstable forms are always a difficulty in varietal nomenclature, inasmuch as a certain proportion of even the most stable forms do not correspond in all respects with the type, although their resemblance is so great that they cannot well be included with any other named form, or bear separate names ; the difficulty is greatly increased with a species so unstable as *hastiana*, and in many of the forms established by this paper, or previously, it will be understood that a considerable latitude must be exercised in including examples not strictly agreeing with the type ; in certain instances I have found it necessary to give one

name to a group of allied forms, specifying as far as possible the characteristics and range of variation in the group, and including all the forms coming within that range under the one name.

If an extensive series of several hundreds of specimens is studied—my series at present consists of about one thousand, picked out of several times that number—it is seen at a glance that the wing markings consist of two different systems; the great bulk of them to one or the other, and only a small percentage combining the two. One of these systems consists of transverse markings, the other those that are longitudinal.

The transverse markings are usually dark and light strigae, or bands; the longitudinal ones, striations, consisting of light or dark scaling, usually predominant on the veins of the wings.

It seems probable, judging from the fact that so many of the Lepidoptera, not only amongst the Tortricidae, but in other groups, have transverse strigae, that this form of marking is a primitive one: the longitudinal striations, being confined to a much smaller number of species, are probably of more recent origin.

These two sets of characters divide the various groups of the species under review naturally into two divisions; Division 1 includes the beautiful forms, *hastiana*, L., *byringerana*, Hüb., *coronana* Thnbg., *bollingerana* Hüb., and many dull forms almost, and in some instances totally, unicolorous. The colour scheme for the bulk of the forms in this division is for a reddish brown or dark fuscous ground-colour, with white, grey, or ochreous strigae and blotches. One may commence with a form with the brown or fuscous markings suppressed, and having wholly white or cream coloured superiors, and end up with a unicolorous grey, brown, or black form.

In the other division are included the remarkable forms *mayrana* Hüb., *combustana* Hüb., *albistriana* Haw., *radiana* Hüb., and perhaps the most beautiful of all, *divisana*, Hüb. The forms in this division are much more stabilised, and there are far fewer intermediates; it is therefore much easier to deal with and systematise them. I should observe here that there are certain recurrent forms with both transverse strigae and longitudinal striations, but these are a minority, and as in most cases the striations appear to be more pronounced than the strigae, I have placed almost all of them in Division 2. Perhaps I might characterise these as striated forms with traces of transverse bands, or strigae.

The longitudinal striations consist of four forms:

- (1) A dark branched streak or vitta extending from the centre of the base to near the termen, as in *psorana* Fröl.
- (2) A light vitta along the inner margin of the superiors, as in *albistriana* Haw. and *combustana* Hüb.
- (3) A light or dark streak, usually not branched, commencing in the centre of the base and extending through the entire length

of the superiors, finishing at the termen, as in *mayrana* Hüb., and *divisana* Hüb.

(4) An even dark striation on all the veins of the superiors; this does not occur in the older named forms, and is therefore probably a recent development: it is not by any means rare now.

The two divisions indicated require subdividing into various natural groups, the forms in each group having closely related characters; and it seems convenient for the purposes of classification that these groups should be established and known by the name of one of the older described forms included in each of these groups; in cases where there are no previously described forms, the group must of course take the name of one of the new aberrations.

As to arrangement in the cabinet, I have described the forms in the sequence in which I place them: I am fully conscious that my classification is not perfect, but it is the nearest approach to a reasonable classification I have at present, after much study, been able to arrive at.

The number of aberrations included in this paper is 66: of these 21 have been described previously, and 45 are new. I have dealt solely with forms known in the Palaearctic Region: there is an identical, or nearly allied species, widely distributed in North America. I have not included the named forms of this, of which there is a considerable number.

As I have previously intimated, the Lepidopterists who have written on *hastiana* during the past century have displayed an almost total ignorance of their predecessors' work. Perhaps the most remarkable of these performances is that of one of the most recent writers on the Tortricidae, Dr. J. von Kennel, in Palaearctic Tortriciden, who in 1908 figured no less than 31 specimens of *hastiana*. Of these very few indeed represent correctly the forms they are intended to portray; ten of them are supposed to represent Linné's type. As a matter of fact not one can by a great stretch of imagination reasonably pretend to do so; and there is not the slightest doubt but that neither the original description, nor Clerck's figure of the type specimen was ever consulted by the writer. It is the old story: an entomologist describes a specimen with particular characters: his successors use his name without even looking at the original description, and as time goes on each writer copies his predecessors' mistakes, makes others himself, each description getting further from the original, until the latter is no longer recognisable.

DIVISION I.

Consisting of forms with prominent transverse markings on the superiors, in the majority of instances: these take various forms, the most usual being a dark base, followed by a pale transverse bar, which again is followed by a dark one: in some cases the dark

central band extends across the superiors, but in others it is restricted to the costal margin, forming there the triangular blotch common to many species of the *Peronidae*. The termen is usually dark, but with blotches of lighter colour near the hind margin. In one instance the lighter colour so predominates that only the slightest trace of the darker areas is visible, and the specimen then becomes practically white or cream coloured. At the other extreme the darker colour permeates the whole of the surface, and gives unicolorous brown, dark grey, or fuscous forms.

As in the allied *P. cristana*, the species under review has on its superiors a number of raised assemblages of scales, but these are not grouped in the two species alike; in *cristana* they take the form of a remarkable discal tuft known as the "button," with subsidiary tufts in many instances; in *hastiana*, however, they are differently arranged. It is true many of the specimens have a small raised discal tuft, but the most pronounced raised scaling consists of the margins of the light central band. In some instances these raised margins are extremely conspicuous.

In classifying the forms in Division I, I commence with the plain white form, follow with those that are banded, and end with the unicolorous dark forms.

Hastiana Group.

I include in this group the white form and those having the lighter transverse markings white, or grey, and the darker ones the reddish brown, or liver colour, obtaining in the great bulk of the aberrations of the species.

(1) *ab. albana* n. ab.

In this aberration the whole of the superiors is hoary white, or cream coloured, with the triangular costal blotch and base alone extremely faintly discernible.

I have two examples from the Frederick Bond Collection labelled Wimbledon: the one I have made the type has the dark markings the least perceptible: it has a cream ground-colour. *Ab. albana* is undoubtedly very rare, but I have seen odd examples in several collections.

(2) *ab. albimaculana* n. ab. Plate 2, fig. 1.

A very beautiful but rare form with hoary white superiors, the costal blotch and base alone being reddish brown. This aberration was bred in some numbers by the late T. Baxter from larvae found on the Lancashire sandhills 20 or 30 years ago; but I understand the locality is now built over. Mr. Mansbridge has recently bred two or three examples, also from the Lancashire coast. My type is from Lancashire. Somewhat larger examples of the form occur rarely at Wicken; in these the costal blotch is more extensive than is the case with the Lancashire specimens, and the dark

markings are more ruddy. I have two of these Wicken aberrations, and there was another in the Farn series, also from Wicken. I have, in addition, one example from Wimbledon, *ex* Bond Collection.

(To be continued.)

NOTES ON BRITISH ORTHOPTERA IN 1922.

By W. J. LUCAS, B.A., F.E.S.

Forficulodea.—It would seem that the Common Earwig, *Forficula auricularia*, Linn., was somewhat late in reaching maturity in 1922. For on the occasion of the S. London Nat. Hist. Society's excursion to Horsley in Surrey on 15 July, though a number of nymphs were obtained by beating, no imagines were noticed: the nymphs, however, were approaching maturity. Even as late as 23 Sept., on another excursion of the same Society, when this insect frequently fell into the beating tray, nymphs occurred as well as imagines: this was near Ockham in Surrey. On 22 July in the Home Park of Hampton Court in Middlesex a male imago of the normal form was found—the first imago seen by me in 1922. In this example the pale spot on the wing-tips was fairly conspicuous. On 25 July, in Kingston-on-Thames, a male imago with dark head, abdomen, and calliper-points, and having the wing-spot fairly distinct was found in a spectacles-case in my pocket: possibly it may have been on the wing in the night, and sought that hiding-place instead of a human ear! Of the variety *forcipata*, Steph., G. Fox-Wilson found on 10 March quite a number—about 8 to 10—in a rotten gate-post near Wisley Bridge in Surrey: no normal specimens were present. These of course had hibernated. Of the same variety J. R. le B. Tomlin sent me four examples which he took towards the end of October on Lihou Island, Guernsey. He said that nearly all the earwigs there seemed to be of the form with large callipers. On 12 Sept., near Yate in Gloucestershire, K. G. Blair found *Labia minor*, Linn., in numbers under stones in an old quarry and also flying freely in the sun. He noted that no ants were under the stones where the earwigs occurred.

Blattodea.—On 1 Feb., I received from H. Main a living female of *Periplaneta americana*, Linn., taken at Tate's sugar factory at Silvertown. It was an imago and in good condition—somewhat exceptional in cockroaches, which are so often partly deficient in legs and antennae. On 15 July a mature female *Ectobius* with pale pronotum—the form *perspicillaris*, Herbst of *E. lapponicus*, Linn.—was taken near Horsley. On 27 July a rather dark example of the same species, *E. lapponicus*, was taken

flying at Rhinefield in the New Forest. The next day an example was twice met with flying in the same district: one of these two, when captured, was found to be a rather dark male. These may, therefore, be taken to be typical *E. lapponicus*. At or near Ockham Common on 23 Sept. a female imago of the form *perspicillaris* was captured. On 22 June a very small nymph, presumably of *Ectobius panzeri*, Steph., was taken in the New Forest. Entomologists would do well to examine critically the forms of British *Ectobii* occurring in the New Forest and elsewhere, since some confusion with regard to them exists at present.

Gryllodea.—On 26 April a nymph of *Nemobius sylvestris*, Fabr. was taken in the New Forest. It was about half grown and clearly must have hibernated. On 26 July two male imagines, and the next day a pair, were taken in the New Forest. About mid-August a New Forest female taken by E. E. Syme laid a few eggs in captivity. The colour was ochreous, the surface being dull with a very fine net-work of markings. The shape was roughly a cylinder with hemispherical ends. Resting on a level surface one longitudinal edge was straighter than the other, while one end was slightly more pointed than the other. The length was about 1.75 mm. and the width about .5 mm. in a specimen measured. *Gryllus domesticus*, Linn., which was so frequent in Kingston-on-Thames during the drought of 1921, was but once heard by me in 1922, when one (or more) was chirping on 27 Sept., as I passed the Brewery in Brook Street. The evening was mistily damp but not cold. Though the chirp was quite loud, it was not clear whether the chirper was out-of-doors or not.

Locustodea.—*Pholidoptera griseoaptera*, De Geer was taken at Yate in Gloucestershire on 12 Sept. (Blair). On 29 July *Metrioptera albopunctata*, Goeze was found near Eastbourne above the cliffs towards Beachy Head (Blair), and there appeared to be "a good number about" at Folkestone on 25 Aug. (E. A. C. Stowell). A female of *Phasgonura viridissima*, Linn. was brought to Blair at Herne Bay on 4 August. On 15 July fairly large nymphs of *Meconema thalassinum*, Serv. were beaten at Horsley (Lucas): on 12 Sept. the species was captured mature near Yate (Blair); and on 29 Oct. a late female was taken from a beech trunk near Shere on the slope of the North Downs in Surrey. No doubt it was there to oviposit, or perhaps had already been doing so. When eviscerated it was found to contain eggs, but by appearance none seemed quite mature (Lucas). *Leptophyes punctatissima*, Bosc was found to be fairly common amongst birches at Boxhill on 15 Aug. (Blair).

Probably the most important find amongst British Orthoptera in 1922 was a macropterous female of *Metrioptera roeselii*, Hagenb. This fine-looking insect was caught by B. S. Harwood at Clacton

in Essex on 16 Aug. It was first seen flying, but was quite invisible when settled in consequence of its resemblance to its environment.



W. J. Lucas, phot.

Metrioptera roeselii, Hagenb. (macropterous form). $\times 1.56$.

side-flaps of the pronotum is greenish-yellow. This uncommon macropterous form is apparently the variety *diluta* of Charpentier, and has not previously been recorded for Britain. The figure is magnified about 1.56 times.*

Acridiodea.—On 13 May not a single specimen of *Tetrix subulatus*, Linn. was seen in one of its haunts—Marlborough Deep—in the New Forest, although there was a good amount of sunshine. Either its imaginal stage was already over, or the wind was too cold for it to move. *T. bipunctatus*, Linn. was first noticed on 17 April, in the New Forest: it was a dark male imago. The day was cold and the insect was not very lively. On 28 Sept. *Gomphocerus maculatus*, Thunb. was taken on Fairmile Common in Surrey. *Omocestus viridulus*, Linn. was first noticed as an imago on 22 June in the New Forest. A male imago of *Chorthippus parallelus*, Zett., in the New Forest on 19 June, was the first capture of this species in 1922. *Stauroleerus bicolor*, Charp. was first seen on 1 July in the New Forest when a large dark greyish-brown example of rather

Harwood, however, struck at the spot where he saw it go down and luckily made a capture. From the front of the head to the tip of the ovipositor the length of the insect is 20 mm., while the wing-expanse from tip to tip of the elytra is 43 mm. These are translucent of a dull yellowish tinge, and the nervures both of wings and of elytra are dark and conspicuous. The edging of the

* Strangely enough another capture of this form of *M. roeselii* was made in 1922 (vide *Entomologist*, lvi, p. 65). It was taken in Switzerland, by T. F. Hewer of Bristol, near Argentière in the Chamonix Valley on 5 Sept. This specimen was a male.

uniform tint was captured. It was met with on 3 Sept. in Mountain Wood near Horsley. On Esher Common in Surrey females were taken on 22 Sept. and 25 Sept., both of rather conspicuous colouring. The former was of a dull deep crimson colour on the dorsal surface of head and thorax, the crimson being finely edged with cream behind the principal suture, which was considerably in front of the middle. The dorsal surface of the closed elytra was ochreous-brown. The latter was an obscurely speckled grey example. The thorax behind the principal suture was black at the sides, and the lateral ridges were marked by a fine yellowish line. On the elytra the white spot and the white line parallel to the costal margin were rather conspicuous. *S. bicolor* was captured at Fairmile Common on 28 Sept., and on 8 Oct. two females were taken at an open place in what appeared to be part of Deerleap Wood near Wotton in Surrey.

Kingston-on-Thames,
7 Mar. 1923.

FURTHER FORMS OF *ARICIA MEDON* FROM COUNTY DURHAM.

BY WILLIAM CARTER and J. W. HESLOP HARRISON, D.Sc., F.R.S.E.

SINCE we described the *cuneata* aberration of *Aricia medon*, a very large number of Durham specimens of that species have undergone close inspection, with the result that an entirely new trend of variation has been discovered amongst them. This lies in the development, to a greater or lesser degree, of a ring of blue scales around the discoidal point on the upper side of the fore wings. Thus there arose in the case of specimens in which the black discoidal spot was replaced by white, a close approximation to that form of *artaxerxes* with a blue discoidal, recorded under the name *caeruleopuncta*, from Galashiels, by Haggart.

Similarly, in examples presenting the *albiannulata* facies, there was a tendency, more or less perfect in its expression, for the ring of white scales to be replaced by the same blue scales. In general this resulted in the white being edged to some extent with blue, so that we have the black discoidal surrounded by white scales, and these encircled by blue. For the whole range of forms displaying this type of variation we propose the name ***caeruleo-annulata* ab. nov.**

It is well to mention here that we have seen this new *caeruleopuncta* form from Kendal and Witherslack in Westmorland.

We have thus the following parallel series :

SCOTLAND.

Var. *artaxerxes* with white discoidal on upper side of fore wings.

Ab. *caeruleopuncta* with discoidal blue.

DURHAM.

Var. *salmacis* with white discoidal on upper side of fore wings; usually smaller than in *artaxerxes*.

Ab. *albiannulata* black discoidal surrounded by white in varying intensity.

Ab. *caeruleo-annulata* black discoidal ringed with blue in varying intensity.

A further phase of variation, *after prediction on a Mendelian basis*, was searched for and discovered in the course of this work, and that lies in the total disappearance of the upper discoidal marks, whether black, white or blue. Specimens exhibiting this peculiarity have been observed in series from Yorks and Durham, and may be known under the name **recessa** ab nov.

Although for certain genetical reasons, developed in a paper to appear shortly, we attach little importance to what is understood by the name *salmacis*, we protest most strongly against the procedure (adopted in Tutt's British Butterflies, vol. iv, for reasons insufficient in our eyes to warrant the step) of coining a new name for males coinciding in everything, except sex, with the *salmacis* of Stephens. Either the female of a species belongs to the same species as its male, or it does not. Since the latter view is manifestly untenable, the former must be true both in regard to species and varieties.

Under the grotesque nomenclature set out in the work just cited, a type of female is left stranded without a name: a second type is attached to a male quite dissimilar from itself, whilst the true male of the second type lies with its flank in the air under the name *similis*!

The real solution of the difficulty rests in a recognition of the fact that each and all of the four insects, no matter what its phenotypical guise, may be of vastly different genetical composition. To coin a word which expresses the fact that they are forms arising from the interplay of Mendelian factors in the field, we prefer to call them "Isogenes," and regard them as better represented by genetical formulae than by names, and the same probably holds true of the forms named for convenience sake—and for that alone—in the present paper.

Natural History Society of Northumberland and Durham,
Newcastle-on-Tyne; March 17th, 1923.

A NEW ARGYNNIS RACE.

By H. T. G. WATKINS.

Argynnis aglaia scotica, subsp. nov.

DIFFERS from typical *aglaia* from Scandinavia in the larger size, much heavier black marking above and below in both sexes, the darker

green of the underside, and greater prominence of the silver spots of both wings. The females are usually very dark, with whitish sub-terminal spots, the tawny ground-colour showing only on the disc of both wings, and extreme forms are practically wholly black.

Types ♂ ♀ Loch Inver. W. Sutherland, July, 1921 (*W. G. Sheldon*), coll. Sheldon. Co-types ♂ 3 ♀ 1, *ibid.*, taken by myself Aug. 8, 1890, in Brit. Mus.

Forms approaching the above occur occasionally in S. England, especially on the moister western side, and throughout Wales, the Lake District, and the West Highlands. A long series from the Horne Collection taken in Aberdeenshire and Kincardineshire are not on the whole so dark as the Loch Inver specimens. Mr. Sheldon's observations in the latter locality are recorded in vol. 55, p. 53, and Mr. F. J. Hanbury's of 1894 in the *Ent. Mo. Mag.*, xxxi, p. 4. I have purposely based the name on the Sutherland, as being furthest from the typical form; but a series from even S.E. England differs very noticeably from a Scandinavian one.

38, Denbigh Road, W. Ealing.

STUDIES AMONG THE AMERICAN GALERUCIDÆ (COL.).

By F. C. BOWDITCH.

(Continued from p. 88.)

***Monocesta Batesi* sp. nov.**

Small sized, yellowish white; tip of antennae dark; elytra dull brick red, lateral border (widened at the middle of apex) yellowish white, and on each elytron a subsutural whitish vitta, beginning below the scutellum and running to below the middle, then widened out, obliquing towards the side, but not quite attaining the light lateral edging.

Type: 2 examples, Ega (coll. by Bates?), Reyes, viii. 95 (Stuart). Length $4\frac{1}{2}$ mm. (Coll. Bow.).

Head with vertex depressed and rather coarsely punctate in a heart-shaped spot, neck and rear smooth; antennae not reaching the middle of elytra; 2 joint small, 3 and 4 equal, last 4 or 5 joints dark; thorax transverse, deeply transversely sulcate (occupying practically the whole area); elytra slightly widened behind, with a faint subsutural costa and obsolete traces of one or two others, entire upper surface of body finely and closely punctulate and with very fine pubescence; claws bifid. The white vitta on a red background easily separates this form.

***Monocesta discoidalis* sp. nov.**

Small, entirely light brown, except antennae gradually shading to black after the first few joints; elytra with a large common elliptical black spot, beginning at the scutellum and ending just below the middle and extending sideways to nearly the middle of each elytra.

Type: 2 examples, Salinas Beni R., vii. 95 (Stuart). Length 4 mm. (Coll. Bow.).

Head with a circular depressed area in the front and vertex, punctate around the edges; antennae reaching the middle of elytra; 2, 3 joints equal, 4 longest of all; thorax transverse, almost wholly occupied by a deep, smooth, shining transverse depression; elytra very thickly and evenly punctate, with several faintly marked, very fine smooth lines, surface sparsely pubescent; claws bifid. The dark discal spot easily separates this form.

***Monocesta* (?) *nigrita* sp. nov.**

Medium size; rufous yellow, with head, antennae, tibiae, tarsi, apex of femora and elytra (latter especially) velvety black.

Type: 2 examples, Manaus, Brazil (Mann and Baker). Length 7 mm. (Coll. Bow.).

Head with concave punctate front, and vertex longitudinally sulcate anteriorly; antennae reaching below the middle: 2 joint short, 3, 4 and 5 about equal; labrum dirty yellow; thorax transverse, punctate, sparsely pubescent, sides rounded but not explanate anteriorly like most of the genus, deeply transversely depressed (like *marginatum*); elytra dark velvet black, very finely punctulate and sparsely pubescent; claws bifid, and the tibiae semi-obscurely mucronate (sexual?).

In looks this species resembles *Galerucella Illigata* Er., but the shape of the thorax is not generic. It seems close to *carbonaria* Baly (which I have not seen).

***Monocesta* (?) *carinipennis* sp. nov.**

Small, parallel: colour above dark olive green, with front of head, scutellum, body beneath, and legs, mostly yellow; labrum and antennae piceous, the latter darker towards tip; upper side of femora and tibiae and tarsi piceous; elytral surface very finely and closely punctate, rugose, with rather sparse, short yellow pubescence; a sharp well-marked humeral carina, from the base straight to the bend of the elytra.

Type: ♀ (?) Cincinnati, Trail, 20. vii. 20, Sierra de S. Lorenzo, 4-6000 ft., Magdalena, Columbia, F. R. Mason (# 149) (Coll. Bow.).

Head with usual cross fovea and also a longitudinal one on the vertex, which is pitted with large punctures and small rugosities; antennae reaching just below middle of elytra, with 2 joint medium, 3 half longer and almost equal 4; thorax half broader than long, sides subangulate at middle, all the angles prominent, the anterior with a single seta; front and rear edges concave, upper surface broadly and deeply depressed, especially the sides, making the rear appear elevated with an antescutellar depression, with scattered punctures and the depression with fine striae; elytra with two ill-defined raised lines between the carina and suture, the apex sharply declivous, coxal cavities open; claws bifid. Does not fit into *Monocesta* very well.

(To be continued.)

NOTES AND OBSERVATIONS.

ZOOLOGICAL RECORD.—We have already called the attention of our readers to the unsatisfactory position of this invaluable publication, and so make no apologies for the following information.

The value of this publication to Entomologists, to whose science almost half the annual volume is devoted, is ably summarised in a statement ordered by the Trustees of the British Museum to be sent to the Zoological Society in support of their appeal for assistance. In this statement they say :

“ With the accumulation of an enormous body of new facts, increasing in amount each year, and much of it hidden away in the pages of publications which are difficult of access, the study of zoology is peculiarly dependent on having the records kept complete and up-to-date. The work of future naturalists would become almost impossible if each investigator had to make for himself a complete survey of the literature of his subject, published during many years without being indexed. The Trustees are accordingly of opinion that the continued publication of the *Zoological Record* is indispensable to the progress of zoology.”

The crux of the matter is that the council of the Zoological Society have now decided that it will not be possible for the Society to continue the publication of the *Record* after the completion of the current volume, unless an adequate amount of financial support can be obtained from other sources. And it must be admitted that it certainly is a little unfair to the Zoological Society that they alone should make good the annual loss—amounting to about £1000—on a publication which benefits the entire field of zoological work.

Additional financial support can only be obtained in two ways : either by direct grants from the various scientific bodies and institutions interested—and we understand satisfactory progress is already being made in this direction—or by increasing the sales. And it has always seemed to us that if only entomologists realised that for the sum of £1 a year they could obtain a complete summary of all the literature of their science published during that year, there would very quickly arise a far greater demand for the *Insecta* part than at present exists. The literature of Entomology grows far too rapidly for anyone to keep pace with it without some system of indexing, which is precisely the function of the *Record*. It contains a list of all papers published, indexed under the authors' names, an index to the subject-matter of these papers, and a systematic index to all new descriptions and other new matter dealt with by the authors whose papers are listed.—N. D. R.

CHANGE OF NAME.—*Nyctipao albicincta obscura* was described by me in the *Entomologist*, xlviii, p. 12 (1915), but the name *obscura* is preoccupied by *Nyctipao obscura* Bethune-Baker, *Novitates zoologicae*, xiii, p. 250 (1906), a synonym of *Nyctipao leucotaenia*, Guenée, which has priority. I therefore rename my aberration, which is described from an unique male specimen, *obscurata*.—A. E. WILEMAN, F.E.S.; Lane End, Dorking, Surrey.

THE ICHNEUMONID GENUS ECHTHROMORPHA.—In 1918 Mr. R. C. McGregor visited Batbatan Island, an isolated spot not far from the

coast of Panay, in the Philippines. The few insects he secured included a very fine Ichneumonid, and as the Philippine ichneumonids are known to consist largely of endemic species, I naturally expected a novelty. On looking the insect up, however, I could only refer it to *Echthromorpha notulatoria* (Fabr.), which abounds in India. To make quite sure I sent it to the U.S. National Museum, where Mr. Cushman examined it and confirmed the determination. The species is also known from Borneo. The members of this genus are remarkable for their distribution, frequently occupying oceanic islands, such as Tahiti, the Hawaiian Islands, Ascension and St. Helena. *E. intricatoria* (Fabr.) is common in Australia; I have one taken by Mr. Hacker at Brisbane. By what means do these ichneumonids cross the seas? Are they capable of unusually sustained flights, or have they some special means of transit? There is evidently something to explain. Possibly they are of greater antiquity than the species of most other groups of Hymenoptera, or are less liable to modification, which is another aspect of the same fact. Perkins refers to the extreme variability of *E. maculipennis* in the Hawaiian Islands, so we may have to postulate a condition in which the species is stable, while at the same time extremely mutable *within specific limits*. Another feature of interest is the conspicuous black spot near the tip of the anterior wings, well developed in the various species. It is undoubtedly a very ancient feature, and the study of fossils shows that such spots persist in some cases longer than supposedly more fundamental (structural) characters. — T. D. A. COCKERELL; Boulders, Colorado, March 4th.

UNUSUAL VARIETIES OF NYMPHALIDAE.—*Aglais urticae*.—My friend Mr. J. Forsyth Johnstone has recently shown me one of the most handsome aberrations of *Aglais urticae* I have seen, which he captured at Ramsgill, Yorkshire, September 3rd, 1922. It is of the recurrent melanic type having the costal blotches suffused, the marginal band broadly black, the normal apical white spot greatly enlarged and suffused over the apex, extending to the middle of the outer margin; the two small normal central black spots are missing as in var. *ichnusa* and the lower median blotch is enlarged. The hind wings are velvety black, the only red being a narrow submarginal stripe running from the anal angle to the middle of the wing; the marginal border is velvety black and broad, with a series of elongated blue markings. The entire colouring is unusually rich.

Melitaea aurinea.—I have lately been able to add a figure to my series of aberrations of a remarkably beautiful melanic example of *Melitaea aurinea* ♀, which Mr. S. G. Castle Russell bred from a Hampshire larva, June 11th, 1922, and kindly lent me for the purpose of figuring. The ground-colour is black clouded with purplish-brown, which is broken up by the greyish neuration into a series of black marginal spots, and another series of elongated central black markings on both fore and hind wings. The deep black discoidal area of the fore wing is crossed by two fulvous-orange spots, the basal one extending to the inner margin; a submarginal orange band and indistinct central fulvous blotches. The hind wings have

the basal half of the costal area of the same deep orange colour, in strong contrast to the rich black markings; at the anal angle are two small whitish dots.—F. W. FROHAWK.

VARIATION IN LEPIDOPTERA.—There is a statement in Dr. A. G. Butler's notes in the March number of the *Entomologist* pp. 66, 67, on which I quite anticipated some of your readers would have had something to say in the April number. No one having done so, as I think the matter should not be allowed to pass without comment, I would like Dr. Butler to tell us his reason or authority for saying that "There can be no doubt that the earliest forms of Lepidoptera were black or brown, white, or a combination of these hues; so that all abnormal examples tending towards melanism or albinism are throw-backs to an ancestral form." Supposing the ancestral forms of Lepidoptera were black, brown or white, which is at least very problematical, why should species, after thousands of years of more varied, but probably constant form, now be reverting to supposed ancestral forms? And if Lepidoptera, why should not plants, animals, and even man be also reverting to ancestral types? Some of us have been studying melanism in Lepidoptera, more or less, for many years, but I venture to say that not one of us would say that we know much more about the cause of it than we did fifty years ago. So far as we know, the conditions of life and existence are pretty much the same as they have been for thousands of years, yet melanism is a very recent phenomenon, and none of the causes yet suggested for it could possibly have been in operation in ancient times. I think Dr. Butler's definite statement certainly requires some explanation.—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, April 7th, 1923.

AN ALIEN MOTH IN MANCHESTER.—A few weeks ago Mr. F. Whitehead brought here a living moth caught in a banana warehouse in Manchester. The insect, which has the appearance of a burnet, spans 35 mm. The general colour is black, glossed with dark metallic green, especially on the abdomen. There is a prominent grey longitudinal stripe on the upper surface of each hind wing, and a similar mark on the lower surface of each fore wing. Viewed from beneath, very conspicuous features are the bright silvery white patches on the front of the thighs of the fore legs, and a large spot of the same colour beneath the two first segments of the abdomen.

Dr. C. J. Gahan, Keeper of Entomology at the British Museum, kindly helped in naming this insect. He writes: "The moth is one we do not possess, but it belongs to the genus *Ceramidia*, and may be a form of the species *butleri*. . . . The moth most probably came from Jamaica."—FREDK. J. STUBBS; Oldham Corporation Museum.

EBULEA STACHYDALIS IN NORTH DEVON.—Upon looking through some of my old entomological journals, I see that I took this species in June, 1906, in some woods on the banks of the river Yeo, about four miles from Barnstaple. The first was taken on June 21st, at sugar, in Raleigh Wood, not far from Collard Bridge. It was a calm, muggy, and rather foggy night. On June 25th another was beaten out of a bed of brambles, nettles and *Stachys* in Youlstone

Wood, near Chelfham Bridge, and more than a mile from the place where the first was obtained. I had never seen this little moth alive before, nor do I think it has been recorded previously from N. Devon.—GERVASE F. MATHEWS; Dovercourt, Essex, March 9th, 1923.

PYRAMEIS ATALANTA IN MARCH.—On March 2nd I saw a specimen of *P. atalanta* sunning itself on a wall in my garden here. I know that this species has not often been observed in this country after hibernation, though, as stated in South's British Butterflies, we have no proof that it does hibernate here. I may say that I do not live close to the coast, although my post town is Emsworth, but am some ten or twelve miles as the crow flies from the outer coast line and about 200 feet above sea level, so that this would not be a likely place for a recently landed immigrant to appear in: besides which, would they be on the move so early in the year?—W. M. CHRISTY; Watergate, Emsworth, Hants.

XANTHIA OCELLARIS IN KENT.—It may be of interest to record the capture of a specimen of *Xanthia (Mellinia) ocellaris* in my garden here on 6th October and another about a mile away on the 15th October. Both were resting under poplar trees.—A. C. KIDNER; "The Oaks," Station Road, Sidecup, Kent.

HELIOTHIS PELTIGERA IN N. WALES.—You will be interested to hear that I took a freshly emerged specimen of *Heliothis peltigera* at light on March 28th. This is an unusual insect for this district—very early. No others were seen.—ALFRED F. COMMON; Hazel-mound, Bangor, North Wales, April 14th, 1923.

I can trace no previous record of capture in this country earlier than May, and none from North Wales.—N. D. R.]

SCARCITY OF SPILOSOMA LUBRICIPEDA AND S. MENTHASTRI.—In Cumberland we find the first-named species in gardens in and about Carlisle. In the country districts to the east of Carlisle I have never come across the species at all; it is reported as rare in the Keswick district. *S. menthastri* is usually common in the county, and comes to light freely. During the years 1921 and 1922 it has been rare, and I did not come across any larvae crawling on the roads at all in the autumn. The years 1921 and 1922 were unusually cold and wet in the county.—GEORGE BELL ROUTLEDGE, F.E.S.; Tarn Lodge, Headsnook, Carlisle, March 30th, 1923.

NYGMIA PHAEORRHOEA, DON. (PORTHESIA CHYSORRHOEA).—Referring to Mr. Adkin's note in the March issue of the *Entomologist*, I have visited a locality on the cliffs, near Beachy Head, which I imagine to be that described by Mr. Adkin at one period or another each year for many years past, with the exception of 1921, and several times have found the larval nests of *Nygmia phaeorrhoea* to be so abundant and conspicuous on the blackthorns as to attract even the attention of passers-by not especially interested in entomology.

The species is now undoubtedly greatly reduced in numbers there, but Mr. Adkin may be interested to know that it is not as yet extinct, or at least, was not so last November, for I then, after a

short search, found a small colony of larvae, which appeared to be hibernating normally.

The nest containing this colony was well hidden in a dense thicket of blackthorn, and in order to ascertain if it held living larvae, it was necessary to cut the twig to which it was attached; I was careful, however, to replace it as securely as possibly amongst the surrounding blackthorn twigs after inspecting it, and if nothing untoward has happened to it since, the larvae should this spring be in evidence.

If the moth had disappeared in 1921, as Mr. Adkin suggests, its presence last November would indicate a fresh immigration, possibly from some other locality close at hand, but the nests of hibernating larvae are by no means always conspicuous objects, quite strong colonies sometimes being contained within a web smaller than a walnut; and as it is highly improbable that I was fortunate enough to come upon the only nest in the neighbourhood, we may hope that Mr. Adkin or some other observer will be able to report a little later on that this interesting moth is not, as yet, extinct in Sussex.—A. L. RAYWARD; Bournemouth, March 17th, 1923.

HYBRIDISATION IN NATURE.—*Epinephele jurtina* and *E. tithonus*.—Mr. K. J. Hayward's note on the pairing of these species reminds me of a similar thing which I noticed in the Bucks Chilterns. When I was collecting there during August of last year I saw *E. jurtina* and *E. tithonus* in cop. (I think the latter was a female), but they unfortunately evaded capture.—J. A. S. BROWN; Keston, Whitechurch Lane, Edgware, Middlesex.

Taeniocampa gothica and *T. stabilis*.—On March 31st, when working swallow at Halling, I took a female *T. gothica* and a male *T. stabilis* in cop, but I am sorry to say no eggs were deposited.—W. J. NEWELL; 22, Culloden Street, Poplar, E.

[Cases of this kind appear to be not uncommon; and even more abnormal sex-relations between individuals of different species are not unknown. For instance, there is, in the Natural History Museum, a ♂ of *Argynnis aglaia* taken in cop. (and still firmly united) with an *Epinephele jurtina*. But beyond showing us that such cross-pairing actually occurs in nature, and that therefore there is a fair probability of the rare occurrence of natural hybrids, they do not prove very much. We have little, if any, evidence that fertile ova are ever produced as a result of these unions.—N. D. R.]

PRESERVATION OF SPECIMENS: MOULD.—After I had been in Malta a few months I found that mould was forming on large numbers of my specimens (in all instances those which had been relaxed before setting), due to humidity and saturation of the air during summer and autumn spells of "sirocco" heat. I am told that in tropical countries, subject to similar spells of humid heat, fires are kept burning in museums containing entomological collections, so as to maintain the temperature of the air above the dew or condensation point, and thus save the specimens from developing mould. In a private house, in hot climates, a fire for such purposes would be quite out of the question, apart from its great cost. I

have, however, quite got over the difficulty by putting most of my specimens in an electrically-warmed cupboard, the warming being effected by two 16-candle-power carbon lamps in series, consuming between them 0.025 unit per hour, or one unit in forty hours. (In many installations a considerably greater number of hours could be run before one unit was recorded, owing to the general tendency of electric meters to under-register with such small currents.) With the lamps at the bottom and at the back, one on each side, enough heat is given to maintain the middle of the cupboard (3 ft. 6 in. by 13 in. by 2 ft. high) fully 5° F. above the outside air temperature. Since adopting this arrangement my specimens have been through two hot summer seasons without developing a single case of mould. Of course the current only requires to be switched on when the hygrometer shows the air to be approaching saturation point. Possibly two 8-c.p. carbon lamps in series might suffice for the same cubic capacity in some cases, thus halving the cost of current, but the air-tightness, thickness, etc., of the cupboard would somewhat govern the amount of heat required. I presume that in England combinations of heat and humidity so rarely prevail that any such warming arrangements as a precaution against mould are unnecessary.—H. F. HUNT; Malta.

THE HORNE COLLECTION.—The concluding portion of this collection was sold at Stevens' Auctions Rooms on Tuesday, April 10th, and although no such extreme prices were realised, as were obtained for some lots in the former portions (*antea* 69 and 93), interest was well maintained right to the end. The groups offered were the remainder of the Noctuas and the whole of the Geometers, in both of which there were many fine series of Scotch forms, also a few lots of butterflies and some books. A long series of *Crymodes exulis* from Unst sold in lots of three made generally round about 35s. to 45s. per lot, and of two 25s. to 30s., but one consisting of a reddish male and an unusually dark female ran up to 65s., while the five Loch Laggan and Rannoch specimens sold singly each made 21s. The specimen of *Calophasia platyptera* taken by the late J. T. Carrington in 1896 ran up to 55s. *Xylina lamula* (*zinneri*) sold singly at 40s. and 75s. (the latter made £10 at the Webb Sale), and one in a lot with a *Hadena peregrina* from the Harper Collection made £4 10s. the lot. *Xylina conformis* in lots of three sold at 30s. to 35s., and *Cucullia gnaphalii* in lots of six at 47s. 6d. per lot, but a couple of lots of over ninety specimens each, which included some really nice forms of *Anarta melanopa* and other useful species, were not dear at a guinea each. Two specimens of *Plusia ni* sold singly at, the one 55s. and the other 47s. 6d.; *Plusia aurifera* and *P. illustris*, from the C. M. Robertson Collection, in one lot made 70s., and *Catocala fraxini* in lots of three 40s. per lot. An interesting aberration of *C. nupta* with practically black fore wings made £7. A lot of thirty-five, which contained one *Acontia solaris* with *A. luctuosa* and *Erastria venustula*, sold for 45s.; a similar one, but with one *Heliothis scutosa* instead of *solaris*, 25s.; one of seventy, which included with *Bankia argentula* and others one each *Thalpochares ostrina* and *T. parva*, 35s.; and a similar one of sixty-six, 40s. A

white aberration of *Rumia luteolata* (*crataegata*) with a unicolorous yellow one made 32s. 6d.; lots of a couple of dozen *Venilia maculata*, which included several nice forms, 40s. and 35s.; and one consisting of one near var. *quadrinaculata* and one broadly banded with brown, 21s. There were several nice lots of *Angeronia prunaria* and the best of them sold for 47s. 6d. and 50s., while one of three consisting of dark, orange and pale forms ran up to 55s. A dozen *Nyssia lapponaria* with like numbers of *N. zonaria* and *N. hispidaria* made 55s. and a similar lot 60s.—a great contrast to the price paid for a single specimen of *N. lapponaria* at the Harper Sale in 1884, when it was supposed to be unique as British and ran up to 13 guineas. A lot containing a hybrid, *N. zonaria* × *N. lapponaria*, and a pair *Biston hirtaria* × *N. lapponaria*, made 65s.; while lots of six hybrids, *N. zonaria* × *B. hirtaria*, sold at 25s., 25s. and 22s. The best pairs of *Cleora angularia* (*viduaria*) made 35s. and 37s. 6d., and the less perfect 22s. and 25s.; and a pair of *Amphidasys strataria* (*prodromaria*), in which the male was almost black and the female of an almost clear white ground and darkly banded, 21s. Long series of selected Scotch forms of *Boarmia repandata* made only 21s. to 25s., while the Devon var. *conversaria* series ran up to 45s. and 47s. 6d. The Zonosomas were put up in four lots, each of which contained some remarkable varieties, and they sold at 30s., 35s., 40s. and 45s., this last containing a melanic specimen of *Z. orbicularia*. A lot of three *Boletobia fuliginaria* made 22s. and another of two 37s. 6d.; a specimen of *Acidalia herbariata*, from the Bond Collection, 22s., and a lot containing two others with one *A. perochraria* 21s. A long series of Baptas and Caberas, which included three remarkable varieties of *B. temerata*, we thought sold cheaply at 8s., as compared with those of *Strenia clathrata* at 35s. and 40s., although they, too, included some very nice forms. *Sterrhia sacraria* sold four for 12s., two for 8s., three for 16s.; one with an *Aplasta ononaria* 30s.; and two with a *Lythra purpuraria*, 35s.; three *L. purpuraria* with thirty-one *Minoa murinata* 35s.; and one *A. ononaria* with an unnamed specimen 42s. There were several drawers of *Abraxas grossulariata*, mostly of the inbred forms, and for the best of these prices of 80s. to 90s. were obtained for lots of five or six specimens, many of the less extreme forms in lots of ten going often for 25s. to 30s.; while the only specimen lotted singly, an almost wholly white specimen bred from an Enniskillen larva, made 55s. Four specimens of *Mesoleuca albicillata*, all good varieties, in one lot, ran up to 45s.; four lots of *Phibalapteryx polygrammata* of four specimens each made 12s., 18s., 35s. and 50s. per lot respectively, the condition of the lots being strikingly reflected in the price; and two very remarkable dark Gareloch forms of *Anaitis plagiata* made, for the perfect one, 50s., and the other, which had very slightly crippled hind wings, 21s. Of the six *Chrysophanus dispar*, which were held over from the sale of the former part of the collection, a fine perfect female appeared cheap at the £7 given for it; another large, but repaired female, made £8, and the others, small or imperfect specimens, 55s., 55s., 45s. and 14s. each; while the six lots of three each of *Nomiades semiargus* (*acis*) sold at from 21s. to 42s. per lot. The two fifty-drawer cabinets each made 33 guineas—an apparently low

price, and probably to be accounted for by the unusual size and shape of the drawers, viz. $20'' \times 15'' \times 2''$. A few books were also included in the sale and realised a total of £40 8s. for the sixteen lots into which they were divided, the chief items being: 24 vols. (1898–1921) of the Transactions of the Entomological Society of London, half morocco, given away at 90s.; complete sets to 1921 of the Entomologist's Record, £5 10s., and the Entomologist's Monthly Magazine, £9 10s.; Wood's Index Entomologicus, 1854 edition, 25s., and Seitz' Palaearctic Macrolepidoptera, in 5 vols., half roan, £8. The total of the day's sale was £720, bringing the total for the whole collection to just over £2920, of which the butterflies accounted for more than £1420.—R. A.

RECENT LITERATURE.

- *A Biology of the British Hemiptera-Heteroptera.* By EDWARD A. BUTLER, B.A., B.Sc., F.E.S. 8vo. Pp. viii + 682. 7 Plates. London: H. F. & G. Witherby, 1923.

THIRTY years have passed since Saunders published his Hemiptera-Heteroptera of the British Islands, and although more than thirty species have since been added to the British list, very little else has been written about this much-neglected sub-order. Mr. Butler, who has devoted a life-time to the study of this group, has at last brought Saunders' work up to date. His book, however, is meant to supplement rather than to replace the latter, and only species recorded as British since 1892 are fully described, although Saunders' descriptions are supplemented where necessary. There is an excellent introduction, in which Mr. Butler discusses the general aspects of structure, distribution and ecology. Of the 3500 species listed by Oshanin as Palaearctic, only 470 occur in Britain, although we possess 301 of the 346 species general distributed over Europe. Six species are recorded from Britain alone. The author deals very fully with the problem of alary dimorphism and with bugs in relation to plant life. The subject-matter is arranged systematically, and under the family and sub-family headings much interesting general information is given. Each species is dealt with under the sub-titles Ova, Larvae, Life-cycle, Habitat and Distribution. Keys to sub-families, divisions and genera are given, and also a table to aid in the determination of the families of non-aquatic larvae. Specific keys are not given, although this might have considerably enhanced the value of the book. The charts showing seasonal and county distribution of every species are an interesting feature, and there is a very useful index of plants with reference to the species found on them. A complete list of the British Heteroptera arranged according to Oshanin's "Katalog" is given together with a complete bibliography. The book is well illustrated with seven coloured and photographic plates and many figures in the text. The numerous quotations and references to contemporary writers show

the extraordinary extent of Mr. Butler's knowledge of the literature of his subject. Indeed the book may be said to contain a complete account of all the work done both in America and on the Continent on the biology of the Heteroptera, so far as it appertains to the British species. Mr. Butler writes with distinct literary skill and his book makes delightful reading apart from its scientific value. He has given us the results of many years' patient study of the British Heteroptera, and his book, which is full of new and interesting facts, will do much to stimulate interest in, and encourage the study of the British bugs.

W. E. C.

Periodicals.

Dr. OUDEMANS (*Tijdsch. v. Ent.*, lxx, pp. 197-211, plates 3-6, 1922) deals exhaustively with the question of the relationship of the Dutch *Heodes* (*Chrysophanus*) *dispar* Haw. with the extinct British nymotypical race, and comes to the conclusion that they are identical, or at least not racially separable. Dr. Oudemans is in the same unfortunate position with regard to being able to examine actual specimens of the English *dispar* in any numbers as we in this country are in respect of the Dutch form. Also his photographs, excellently reproduced, were taken under entirely different conditions. But, allowing for this, we cannot but think that he has somewhat underestimated the value of the differences which we see between the two races, and which were enumerated in a previous number (*Ent.*, liii, p. 10, 1920). These are so marked that there should be no difficulty in picking out Dutch specimens from amongst a series of British examples, or *vice versa*, almost as easily as can be done with specimens of the usual Continental forms.

Dr. BARNES and Mr. BENJAMIN (*Cont. Nat. Hist. Lep. N. Amer.*, v, No. 2, 1923), in their praiseworthy search after finality of generic names for the N. American Lepidoptera, raise the question of the name *Phalaena*. As is generally well known this was one of Linné's *genera* of the Lepidoptera. Unfortunately for later workers on this order, Linné subdivided it into several "phalanges," *e.g.* *Bombyx*, *Noctua*, etc. These names are all in general use, whereas *Phalaena*, the only name which Linné definitely gave as that of a *genus*, is not. The authors believe that in accordance with the *International Rules of Zoological Nomenclature*, it is incumbent upon us to employ *Phalaena* as a valid generic name, and they go on to prove that in accordance with the same *Rules* the type of the genus must be taken as *typica* L.—*Naenia typica* of most authors. Further, they maintain that *typica* is also the type of *Noctua*, and that consequently this familiar name will have to disappear from our lists. With the case of *Lemur* Hb., which the same authors cite as having precedence over *Mormo* Ochs for our familiar *Mormo maura* L., however, the case is different, as *Lemur* is already preoccupied and consequently cannot be used. *Mormo* will therefore remain.

N. D. R.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 7th, 1923.*—Mr. E. E. Green, President, in the Chair.—The President announced that Dr. G. A. K. Marshall, C.M.G., had been selected for election as a Fellow of the Royal Society, and a vote of congratulation was passed to him, with acclamation.—*Election of Fellows.*—The following were elected Fellows of the Society: Mr. A. M. Stewart, 38, Ferguslie, Paisley, Renfrewshire, Scotland; Mr. F. G. S. Whitfield, 25, Drayton Gardens, S. Kensington, S.W.; Mr. A. J. C. Wightman, "Aurago," W. Chiltoning Common, Pulborough, Sussex.—*Exhibitions.*—Mr. C. Talbot exhibited, on behalf of Mr. J. J. Joicey, a number of Gynandromorphs of Lepidoptera from various parts of the world.—Major H. C. Gunton exhibited a remarkable variety of the *Grammesia trilinea* from Gerrards Cross, Bucks.—Prof. E. B. Poulton, F.R.S., produced further evidence that the wings of Lepidoptera are sometimes attacked by caterpillars; he also exhibited and made remarks upon some fragments of beetles from a Pleistocene peat-bed at Wolvercote, nr. Oxford. These specimens gave rise to considerable discussion, in which Mr. K. G. Blair took a prominent part.—Mr. J. H. Durrant exhibited an example of *Hieroxestis sanctae-helenae* taken in a house at Margate, and suggested that it might have been introduced *via* the Canaries in bananas.—Dr. Malcolm Burr referred to the necessitous circumstances of A. P. Semenov Tian-Shanski, an Honorary Fellow of the Society in Petrograd, and said that remittances could be sent to him through the American Relief Fund, and a proposal by Mr. J. H. Durrant, seconded by Mr. J. E. Collin, that the Society should head the list of subscribers with a donation of 20 dollars was passed unanimously. Mr. A. Dicksee kindly undertook to collect and transmit the remittances to this Fund.—*Papers.*—The following papers were read: (1) On a Lepidopterous Scavenger living in Parrots' Nests, by Dr. A. Jefferis Turner. (2) On the Mouth Parts of the Micropterygoidea, by Dr. R. J. Tillyard.

Wednesday, March 21st, 1923.—Mr. E. E. Green, President, in the Chair.—The following were elected Fellows of the Society: Messrs. A. E. J. Carter, "The Retreat," Monifieth, nr. Dundee; L. G. Cox, 90, Marine Parade, Worthing; F. C. Garrett, West Croft, Hexham; G. Handley, 54, All Saints' Road, King's Heath, Birmingham; H. Notman, F.S.A., 136, Joralemon St., Brooklyn, New York; D. A. Owen, 94, Wellington Street, Luton, Beds; L. G. Saunders, B.Sc., Molteno Institute, Cambridge; E. G. R. Waters, M.A., 40, Leckford Road, Oxford; E. J. Winstanley, L.D.S., R.C.S., 25, Fellows Road, Hampstead, London, N.W.—Mr. A. Dicksee reported on the fund initiated at the last meeting for Prof. A. P. Semenov Tian-Shanski, and a Committee consisting of Dr. Burr, Mr. Dicksee and Mr. Uvarov was appointed to consider the rendering of assistance to other members of the Russian Entomological Society.—*Exhibitions.*—Dr. S. A. Neave exhibited on behalf of Sir Gilbert Carter a number of butterflies collected by him in the Canaries, and read some notes on them prepared by Mr. N. D. Riley.—Mr. G. Talbot exhibited on behalf of

Mr. J. J. Joicey some African butterflies, including the hitherto unknown female of *Alaena aurantiaca*.—Mr. H. E. Andrewes exhibited examples of Carabidae from the Oriental and Australian regions.—Prof. E. B. Poulton, F.R.S., exhibited a series of *Heodes phlaeas pseudo-phlaeas* from Abyssinia, and also a Satyrine butterfly of strong Palaearctic affinities from Somaliland.—*Papers*.—The following papers were read: A Contribution to our Knowledge of the Orthoptera of Macedonia, by Dr. M. Burr and others. On the Homology between the Genitalia of some Species of Diptera and those of *Merope tuber*, by Mr. F. Muir. Records and Problems of Insect Migration, by Mr. C. B. Williams.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*March 8th, 1923*.—Mr. N. D. Riley, President, in the Chair.—Mr. A. A. W. Buckstone gave a box of British Lepidoptera to the Society's Reference Collection.—Mr. R. Adkin exhibited the following aberrations of Palaearctic Rhopalocera, which had been artificially produced: *Pyrameis atalanta*, with red band almost obsolete, *Vanessa io*, with ocelli obliterated, *Aglais urticae*, with unicolorous blackish-brown, *Eugonia polychloros*, with smeared blotches on fore-wings, *Apatura iris*, with white bands nearly obsolete, *Melanargia galathea*, *Dryas paphia*, etc., and others of each species; Mr. H. Moore, *Anosia archippus*, taken 100 miles off the coast of S. America, cases of the large "bag-worm" *Oeceticus omnivorus* (*Psychidae*) from N. Island, New Zealand, and referred to its dipterous parasite *Eurigaster marginatus* and hyper-parasite (*Pteromalus* sp.), and the giant cricket "Weda," *Hemideina megacephala* of New Zealand, with notes on its depredations and habits; Mr. Hare, a probably unique aberration of *Anaitis plagiata*, a wide-banded form from Erith, and a markingless example of *Leptosia sinapis* from Symons Yat; Mr. O. R. Goodman, a series of *Thymelicus acteon* from the Isle of Purbeck, with a series from S. France, and pointed out that the males of the latter had both the stigma of the ♂s and the crescentic line of the ♀s of the former series; Mr. F. W. Frohawk, British *Aporia crataegi*, with supernumerary veins developed in the hind wings, others with discoidal spots on the hind wings, and others with dark hind-marginal shading; Capt. Crocker, a curious aberration of *Polyommatus icarus* with all the usual markings obsolescent and the ground-colour of a light brown generally. Dr. Fremlin read a paper entitled The Growing Importance of Entomology, which was followed by a short discussion.—HY. J. TURNER, *Hon. Editor of Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*February 20th, 1923*.—Mr. J. W. Griffin, F.E.S., presided.—Three new members were elected, and a resolution was passed admitting junior members to the Society at a reduced subscription in order to encourage beginners. Unfortunately Prof. Newstead was unable to deliver his lecture. The Annual Dinner was postponed until the autumn. Mr. Mansbridge exhibited and explained a beautiful collection of about 70 lantern-slides which he had on loan from Mr. Hugh Main. Mr. Mansbridge also exhibited a single specimen of a species of Lepidopteron new to Britain, *Auximobasis normalis* (Meyr.), which

he had found on the dock wall, Liverpool, in September, 1921. He considered that it was probably imported as a larva or pupa, and stated that Mr. Edward Meyrick has a series from Ecuador and Columbia, that twenty-five species are known belonging to the genus, that the larval habits of *normalis* are not yet known but that it is probably a seed eater. He also showed a series of *Peronea hastiana* from the Isle of Wight, comprising vars. *divisana*, *radiana*, *centrovittana*, *combustana* and *brunneana*, with corresponding varieties from Lancashire localities for comparison. It was seen that the Lancashire specimens were all very much darker than the parallel forms from the Isle of Wight.—Mr. Tyerman also exhibited a very variable series of the same species which he had bred from Lancashire larvae last year.

THE WALLIS CLUB, NEWCASTLE-ON-TYNE.—March 5th, 1923.—The President, Dr. W. J. Fordham, in the Chair.—Prof. E. B. Poulton, F.R.S., and Mr. Chas. Robson were elected Honorary Members. The President initiated a discussion on "Lines of Work," and as a result it was decided to conduct a regional survey of the Team Valley.—Mr. R. S. Bagnall exhibited and explained a beautiful set of Thysanoptera from Baltic amber, including, in addition to genera existing to-day, many new genera and species.—Mr. A. D. Peacock, M.Sc., gave a discourse on sawflies, indicating the biological problems their study was likely to elucidate and the course his own experiments on parthenogenesis in the group had taken.—Mr. William Carter brought a unique series of *Aricia medon*, comprising not only the known British forms but those from the continent. He explained how the chance capture of an aberration of this species had transformed him from being a collector into a student of genetics. In connection with this exhibit Dr. J. W. Heslop Harrison pointed out in the series a number of examples of the new form *caeruleo-annulata* (Carter and Harrison) in which the white ring proper to the variety *albiannulata* was in turn ringed with blue.—Mr. John Baxter read a paper on the protective devices of *Dicranura vinula*, and described his experiments with the secretions, etc., employed by the larva.—Dr. J. W. Heslop Harrison introduced a discussion on the pollination of *Primula veris* and *P. acaulis*, showing that the only insect associated locally with the primrose when it flowered in sufficient numbers to secure its fertilisation was the Thrips, *Taeniothrips primulae*. He also mentioned that *Bombylius major* played a part—an observation confirmed by Mr. J. R. Johnson. Despite the reputed sterility of the F₁ primrose-cowslip hybrid, Dr. Harrison produced examples of the back cross with each of the original hybrids.—Dr. Harrison exhibited a coal-black *Tephrosia bistortata* reared under experimental conditions from a type-strain from the same Kentish woods in which Mr. Edward Goodwin discovered the melanic forms of *Tephrosia consonaria* and *Boarmia consortaria*.—Mr. G. H. Anderson announced the discovery of an inland habitat in Durham for *Aricia medon* on the limestone near Lanchester.—Dr. F. C. Garrett provided on the strength of captures by his son, Master E. H. Garrett, the first Northumberland examples of *Xanthia citrigo* and *Boarmia consortaria*.—Dr. F. C. GARRETT, Secretary, West Croft, Hexham.

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SOME AGRIADES CORYDON ABERRATIONS FROM THE BUCKS CHILTERN (TRING DISTRICT).

BY R. B. BENSON.

I NOTICED in the Entomologist for February, 1922, this : " The study of local and seasonal variation would be far more profitable to the science than the encouragement of the aberration hunter." therefore I put forward this paper as an attempt to show the aberrational characteristics of this colony of *corydon*.

Although I did not fully use the advantage offered for studying the effects of a hot season as in 1921 and a cold one as in 1922 on *Agriades corydon*, I have noted the following points : 1921 males were less green and showed less colour variation, but ab. *suavis* Tutt, with the orange markings in the margins of the hind wings on the upperside, was very abundant in all its localities round here ; females, as others have observed in other districts, showed less blue on the upperside, although I captured one complete ab. *syngrapha* on July 30.* Undersides were usually dark and heavily marked, but the better streaked and obsolete forms were much more numerous in ♀s than ♂s.

In 1922, however, males showed a large variety of colour and types of margins ; the greenish upperside variety was particularly common, and I noticed several with yellow hairs on the body and yellowish fringes to the hind wings. Ab. *suavis* was much rarer than in 1921. Females showed much more blue than in 1921 on the upperside ; ab. *semisyngrapha* was quite common. The undersides also showed a much greater variety of forms, so that even in ♂s they were quite common (♀s in this locality are more numerous than ♂s).

The large number of specimens with crippled or misshaped wings noticeable in 1922, was perhaps due to the effect of the dry summer of 1921 on their food-plants and hence on their proper development.

2 ♂s, very nearly ab. *fowleri*, were taken here in 1922, as also were several with very thick dark margins. I obtained four of the female intersexual forms ab. *roystonensis*, two with the right side

* It is interesting to note that I captured another in exactly the same spot on Sept. 5, 1922.

and two with the left side small, but each of these is of a definite different underside type. Another $\pm$ has the upperside of the right hind wing streaked with bluish white. This streak stretches from the base, and meets the margin in two parts between veins 1 and 2, and 4 and 5. The marginal spots occurring in the blue are round black spots of the male type, while all the other marginal spots are typical female in form. I captured this specimen on Sept. 5, 1922.

Amongst the enormous variation of female colour types there are a few definite distinct variations. One type is very dark on the upperside with yellow spots in the margins, upper and undersides; the undersides are very grey. Tutt has mentioned the yellow spotted form, ab. *flavescens*, but does not mention the very black uppersides accompanying it, as in these specimens. I have looked through a fairly long series from Royston and found none of this type, nor have I found specimens leading up to this variation from the normal, though this dark type was not uncommon itself in 1922. Another upperside female variation has bluish-white spots on the upperside of the hind wings exactly corresponding, in position, to the four spots in the submedian row of the underside of the hind wings between veins 2 and 3, 3 and 4, 4 and 5, and 5 and 6. I have 3 of this type and have seen others from Royston. I do not think this type has been mentioned or described before.

Several $\pm$ s have splashes or streaks of blue on the upperside, but a blue more like the tint of *A. thetis*.

On Sept. 22, 1922, I captured a $\pm$ approaching ab. *semisyngrapha*, in which the marginal spots to the upperside of the hind wings were bluish white, faintly tinged with orange on the inner side; the spots, however, are well formed. This I believe is a very uncommon form; blue has occurred within the circle of these spots, but not bluish white to such an extent as this. Perhaps this is an inter-sexual form.

Ab. *subradiosa* Tutt: $\pm$ s with blue on the upperside of the hind wings in radial form between the darker veins are not rare here, but I have one or two in which the veins are light brown and the interneural spaces very dark with black and blue scales. One $\pm$ on the upperside is normal brown but the veins 2, 3 and 4 on both hind wings are bluish white: the underside is particularly pale, in fact the ground-colour is white on the central and outer areas of the forewings and the outer area of the hind wings. The spots are much reduced in size, especially those in the margins of the forewings, which are reduced to mere specks. This was caught on Aug. 26, 1922.

On September 5, 1922, I captured an example showing homoeosis. On the underside of the right hind wing is a dark patch stretching from the inner margin to vein 4, thus covering about half of the hind wing. This patch consists of dark brown, black

and blue scales (blue chiefly on the inner margin just as on the upper-side of the same wing). All the spots, except for the end spot—on the inner margin—of the submedian row that occur in this area of the wing are present, and so is the white surrounding them, but the penultimate spot of the submedian row has joined with one of the basal spots. The orange spots between veins 2 and 3, and 3 and 4, are much enlarged, but the black marginal spots in the orange are normal. The left hind wing is quite normal in marking. The right hind wing, however, is slightly enlarged. I have communicated with Dr. E. A. Cockayne about this specimen.

St. Catharine's College,
Cambridge;
3 Feb., 1923.

OBSERVATIONS ON THE LIFE-HISTORIES AND HABITS OF *ALLANTUS PALLIPES* SPIN. AND *PRISTIPHORA PALLIPES* LEP. (HYM. TENTH.)

BY MISS E. F. CHAWNER and A. D. PEACOCK, M.Sc.

THE study of these types was commenced by one of us (C.) at Lyndhurst, Hampshire, in 1920, while from specimens sent to the other for cytological work in July, 1921, other observations were made at Ryton, co. Durham. Each has regarded the types from a different point of view, and we find, naturally, that certain of our observations are both confirmatory and complementary. We have therefore deemed it advisable to collaborate and present the facts in one place in as complete a form as possible.

In both places females and larvae were usually confined in suitable bell-jars inverted over growing plants or cuttings in water, and kept in a room. Females at Lyndhurst were given opportunity to feed on pure honey: at Ryton a syrup of sugar and water was used. Water was accessible in both cases. From our separate sets of experiments the slight differences observed in the dates and periods of the various stages in life-histories are not of importance.

We are indebted to Dr. R. C. L. Perkins, F.R.S., for notes on *A. pallipes* which are quoted hereafter.

Allantus pallipes.

This species is known also under the following names: *Emphytus pallipes*, *Empria pallipes* and *Emphytus grossulariae*. That used here is given by Enslin in *Die Tenthrenoidea Mitteleuropas*.

Time Records of Stages of Allantus pallipes.

	At Lyndhurst.	At Ryton.
	1920.	
Hibernating generation.	Oct. 18, 19: 46 larvae collected. „ 26: Moulded for last time; burrowed at once into pith and rotten wood. Nov. 6: Last larva disappeared.	
	1921.	
Spring or first generation.	April 29: 2 females hatched; fed. and laid some eggs. „ 30: More eggs.	1921. May 5: Received eggs from Miss Chawner. „ 15: Eggs hatching.
	May 16: Earliest eggs hatching. June 18: All have burrowed. July 6: Female; eggs laid. „ 8: Many more females; all laid as soon as provided with leaves.	
Summer or second generation.	„ 15: Earliest eggs hatching. Aug. 9: Larvae full fed and burrowing.	July 12: 2 females; laid at once. „ 19: Last female hatched. Aug. 8: Burrowing.
Hibernating generation.	„ 29: Several females; eggs at once. Sept. 10: Larvae hatched. Oct. 11: Larvae burrowing.	Sept. 2: 7 females. „ 7: Females still hatching; eggs at once. „ 14: Larvae out. Oct. 12: Larvae burrowing.

The terms designating the generations have been adopted on the following grounds. The first complete generation of the year is that commencing with the eggs laid in the spring, April, and ending with the ovipositing females of July. This has been termed the first or spring generation. The succeeding offspring are regarded as belonging to the summer or second generation, and the generation next again, which is not completed until the following year, as the autumn, third or hibernating generation. As there are, however, three sets of adults, eggs, larvae and pupae every twelve months, at least during the period Oct., 1920–Oct. 1921, the species should be regarded as triple-brooded. Two broods are completed during the vitally active seasons of the year and one after hibernating. As may be gathered from the following note, kindly

furnished by Dr. Perkins, the questions of the precise number of generations per annum may require modification :

"Some years ago" [at Paignton, Devon] "I found the larvae destroying all the pansies in my children's garden, which was a little strip between two walls and the only moderately damp spot in a large garden. They were noticed in June first and imagos hatched out very quickly. Though I crushed most of them subsequent broods continued all through the summer, and I reckoned there must have been anyhow four broods in all. The larvae were numerous in November, when I killed all I could find, and there were none found in the following years." It is therefore quite possible, according to seasonal conditions, that another brood may be interpolated, though there also exists the more likely possibility that late emerging insects from each of the three broods may have given the impression that more than three generations had emerged.

Summary of above Results.

	Spring generation.	Summer generation.	Hibernating generation.
Incubation period . . .	17 days.	9 days.	11-12 days.
Larval period	33 "	25 "	26-31 "
Pupation period	18 "	20-25 "	17-4 "
Total period from egg to egg-laying	68 "	54-59 "	211-217 "

The span of the summer generation was therefore the shortest—8 days or more less than that of the spring—the quicker hatching and feeding periods more than compensating for a somewhat more lengthy pupal period. The incubation and larval periods of the summer generation were also the quickest and those of the spring the most tardy. It is possible that the unusual drought and heat of the year 1921 may have shortened the periods for the summer.

HABITS.

Parthenogenesis.—Three successive generations of females have produced eggs parthenogenetically, and all the adults hatched—a total of at least 162 (100 C. : 62 P.)—have been females. In addition, only females were obtained from eggs sent to the Rev. F. D. Morice. All the females utilised for egg-laying—at least 33—have laid fertile eggs. Eggs may be produced by females which never have fed, but have had access to the moisture of condensation on their glass cage. Cameron apparently only knew the female of this species, and in a letter to Mr. Morice, Dr. Enslin says he does not know the male, and believes that it has not yet been discovered.

Viability.—It would seem that the flies do not live beyond 7 days after emerging, and this span also marks the egg-laying period. This is in accordance with general experience in rearing

sawflies. They are readily eaten by insectivorous birds, and for this reason may not live out their span.

Egg-laying.—The female, once it is able to fly, begins to lay immediately. It stands on the upper and green side of the leaf and the saws are inserted on the slant between the veins. The egg is laid deep down, as the dilatation produced in the leaf is observable only on the lower and lighter coloured surface. As many as 15, irregularly scattered, have been counted on one leaf of viola in the laboratory. As the egg grows the leaf shows a whitish blistered appearance beneath, but evidence of the presence of eggs is not readily detected on the upper side. As many as 12 may be laid in 30 minutes by a single fly, and one pair of females produced 55 in 5 days while another pair gave 61 in 6 days. There is variation in the rate of laying and in the number of eggs produced, and the former is certainly affected by weather, it being more rapidly accomplished in warm sunny weather.

(To be continued.)

PERONEA HASTIANA, L. : ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 104.)

(3) *ab. costimaculana* Wocke.

Synonymy.—*Costimaculana*, Wocke, Breslau, Ent. Zeit. p. 16, (1874); Staudinger, Cat. Pal. Lep. ii. p. 80, No. 1446 i (1901); Stephens, Haust. iv. p. 156 (1834) (*byringerana*); Curtis, Brit. Ent. 16, No. 34 (post 1834) (*byringerana*); Herrich Schäffer, Syst. Bearbtg. der Schmett. von Europa, iv. plate ii, fig. 13 (1847) (*scabrana*).

Original description. Vorderflügel weissgrau mit einem teibraunen trapezförmigen Vorderrandfleck. (Wocke *l. c.*)

It is difficult to grasp Wocke's meaning when he speaks of a "costal spot in the form of a quadrangle," for what is generally understood to be a quadrangle would be outside the range of variation one could imagine would occur in *hastiana*: but I take it he means a spot or blotch, with the two sides projecting from the costa towards the centre of the wing, *at right angles to each other*, or approximately so, and the area they enclose would thus form a right-angled triangle, or half a quadrangle. This of course means simply the ordinary triangular costal blotch common to many aberrations of *hastiana*, as well as to most of the other species of the Peronidae. This explanation may seem somewhat stilted, but I can see no other, and I may mention that our greatest authority

on the Micro-Lepidoptera, Mr. J. Hartley Durrant, agrees with my definition.

Ab. costimaculana, as I define it, is a not uncommon form in Britain. I have examples from Lancashire, the Isle of Wight, Rannoch, and Lochinver.

(4) *ab. rufimaculana* n. ab. (Plate 2, fig. 3.)

This form I describe as: similar to *ab. costimaculana*, as defined by me, but having the dark markings bright reddish brown, instead of dark brown. A fairly common aberration: my type comes from Lochinver: I have also examples from Wimbledon (many) and the Isle of Wight.

(5) *ab. mixtana* n. ab. (Plate 2, fig. 4.)

In this aberration the light-coloured portions of the superiors, which are white, are crossed longitudinally by pronounced dark striations of reddish brown—a character that will best be understood by reference to the figure.

This very beautiful form I bred in 1921 from larvae obtained at Lochinver, and in the adjacent island of Soyea. About a score of examples were bred, and there was a large number intermediate between the aberration and the typical form. The very beautiful type is from a Lochinver larva. So far as I am aware aberrations of this group with longitudinal striations have not been detected hitherto or elsewhere than in the very restricted locality where I found it: forms from the only other Sutherlandshire locality in which I obtained *hastiana* larvae, Invershin, were without any traces of these striations. *Ab. mixtana* was even more striking in appearance when alive than it is mounted as a specimen: it then strongly reminded one of the beautiful so-called "white" aberrations of *cristana*.

(6) *ab. rufimixtana* n. ab.

Similar in all respects to the last, with the exception that the light striga crossing the superiors is suffused with a beautiful red colour; it is even more beautiful than *ab. mixtana*, and is found in the same district: it is much the scarcer of the two. I have three examples from Soyea, and one, the type, from Lochinver.

(7) *ab. byringerana* Hüb.

Synonymy.—Hübner, Vogel, fig. 97 (1793): Haworth, Lep. Brit. p. 413, No. 63 (1811) (*eximiana*): Hüb. Tort. fig. 216 (1818) (*byringerana*): Hüb. Verz. p. 385, No. 3735 (1826): Fröl. Tort. Wurt. p. 23 (1828) (*leprosana*): Stephens, Cat. ii, p. 186, No. 7069 (1829): Curtis, Guide, 1st edn., p. 173 (1829): Treitschke, Schmett. von Europa, viii. p. 257 (1830) (*sparsana*): Rennie, Conspect.

p. 177 (1832) (*coronata*); Stephens, Haust. iv, p. 156, 1834 (*coronata*); Duponchel, Hist. Nat. des Lep. de France, vi, p. 554, and pl. 265, fig. 2 (1834) (*abictana*); Curtis, Brit. Ent. 16, No. 36 (post 1834) *coronata*; Curtis, Guide, 2nd edn., p. 202 (1837); Heinemann, Schmett. Deutsch. i, p. 14 (1865); Staudinger, Cat. Lep. Eur. ii, No. 652 *b* (1871) (*buringerana*); Snellen, Vlind. Ned. Micr. p. 177 (1882); Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1416 *b* (1901); Meyrick, Gen. Ins. fasc. 149, p. 64 (1913).

Hübner figures and names this beautiful form but does not describe it. The following is a description I have made from his figure (*l.c.*):

Head and thorax reddish brown; abdomen grey, hind wings grey, shaded with darker grey around the outer margins; superiors, base reddish brown, with darker shading; a diagonal grey-green narrow streak runs from the centre of the outer margin of the basal patch to inner margin; next to the basal patch is a light coloured band extending across the wing, almost straight on margin next basal patch, but very irregular next outer margin of wings; this light band is shaded with light brown and greyish green, and is followed by another red-brown area, extending as far as the termen; included in this dark area are two grey-green dashes; the anal angle of the wing is greyish green with an arch marking; the space between this and the termen is light brown, thickly sprinkled with black dots.

It is extremely difficult to make a description from this figure of Hübner's that will enable the student to grasp its appearance, therefore, if possible, the figure itself should be seen, or if that is not possible, then his second figure, Tort. 216, named by him in this work *buringerana*, but afterwards in Verz. corrected to *byringerana*. Hübner, in Tort. fig. 61, gives a third figure, to which he attaches the name *byringerana*; this is an entirely different form, and, moreover, as he afterwards corrected the name of this figure to *bollingerana*, the latter name must stand for fig. 61; I deal with it later in this paper. It will of course be understood that all the *hastiana* aberrations figured by Hübner, nine in number, were regarded by him as distinct species.

One of the difficulties in dealing with Hübner's first figure (97 Vogel) is the grey-green tint on the superiors. I have never seen an example of any form of *hastiana* that showed the slightest trace of this colour, and am very doubtful indeed if anyone else has; but his second figure (Tort. 216) is without trace of this colour. What I think happened was this. As I have before pointed out, in certain specimens the dark red-brown patches are thickly sprinkled with white scales, and I have seen examples with these scales so thick in patches as to give a hoary grey appearance, not very distinct from greyish green. One must remember that it

was the custom of the old lepidopterists, whose plates were all hand-coloured, even when they were superb artists, as Hübner undoubtedly was, to employ other artists to colour their plates, probably from a specimen copy coloured by the author himself.

Ab. byringerana is one of the most beautiful of the *hastiana* forms; the white transverse bands and other markings contrast exquisitely with the reddish-brown or liver-coloured portions of the superiors. It is not by any means an abundant form in Britain, but is widely spread; I have examples from Lochinver and Rannoch in the North, to Kent and Wimbledon in the South, but my most beautiful specimens come from Wicken, where, however, it is very rare.

As will be gathered from the synonymy, *ab. byringerana* has been a much misunderstood form, and has received several other names, and on the other hand, as will be seen later, many authors have applied the name to other forms.

(To be continued.)

NOTES ON BRITISH PARANEUROPTERA (ODONATA) IN 1922.

By W. J. LUCAS, B.A., F.E.S.

AT its commencement the season did not seem to promise badly, starting as it did with weather which appeared to herald a repetition of the drought of 1922. Later it was much less satisfactory; but whether this was owing to the lack of summer sunshine or to the effect of the previous drought must be left to conjecture. Bearing in mind the former condition, the late dates on which insects were first noted and the scantiness of the following records need not always be set down to a partial failure of the insects themselves, but often to the excursions in search of them being damped by the weather.

My first dragonfly of the season was a female of *Pyrhosoma nymphula*, Sulz., caught in the New Forest on 11 May. As it had not a very teneral appearance it probably had emerged before that day: a teneral male was caught in the Forest on 16 May. My second dragonfly experience was the sight on 15 May of one at the western edge of the Forest, which could only have been *Cordulia aenea*, Linn. On 22 May *Enallagma cyathigerum*, Charp. and *Erythronma nias*, Hans. were emerging at the Long Water in the Home Park at Hampton Court, Middlesex, and by this time the dragonfly season may be said to have well commenced. The last specimens seen by me belonged to the genus *Sympetrum*, Newm., the date being 16 October, and the locality the Black Pond on Esher Common, Surrey.

Aeschnidae.—A male of *Gomphus vulgatissimus*, Linn. was captured at Oberwater in the New Forest on 18 June. Members of this species seemed to be usually in teneral condition: one that was taken to be ovipositing appeared to be doing so after the manner of *Aeschna grandis*, Linn. *Cordulegaster annulatus*, Latr. was not met with till 21 June in the New Forest. A specimen of *Aeschna mixta*, Latr. was taken on 9 Sept., resting on a bramble-twigg in a brickfield at Highfield, Southampton (F. J. Killington), and on the 28th of the month a male of this scarce dragonfly was captured by myself at the Black Pond. On 11 June a bright blue *Anax imperator*, Leach, was seen at rest near Peaslake, Surrey, but was not secured: on the same day K. G. Blair saw a specimen at Stanmore, but he also did not succeed in making a capture. On 11 July a fair number were present at the Black Pond, but one male only was taken.

Libellulidae.—Of *Cordulia aenea*, besides the one sighted in the New Forest on 15 May, an example was caught at Esher Common on 26 May: it was plentiful there on the 31st of the month. This species was seen near Peaslake on 30 May, while Blair found it fairly common on 11 June at Stanmore and captured four specimens, all males. *Libellula quadrimaculata*, Linn. was rather plentiful at Esher Common on 26 May, and more so on the 31st. It was seen near Peaslake on 30 May and in the New Forest on 16 June, while two or three specimens were observed at the Black Pond on 11 July. Blair met with a fully coloured male *Libellula depressa*, Linn. on 11 June at Stanmore, and it was seen in the New Forest on 16 June. *Orthetrum caeruleum*, Fabr. was seen in the Forest on 16 June, but no example with the blue tint was met with; a considerable number, however, with full colouring were seen there on 21 June. E. A. C. Stowell found *Sympetrum striolatum*, Charp. at Dymchurch, Kent, on 20 August, and it was on the wing at the Black Pond as late as 13 and 16 October. D. J. Gordon did not meet with *Sympetrum scoticum*, Don. till September in Ross-shire, where, he says, it is usually out in thousands all the summer: it was flying on Esher Common on 25 and 28 September and on 13 and 16 October. F. M. B. Carr found *Leucorrhinia dubia*, Lind. very plentiful during the summer rather exceptionally so, he thought—at Delamere in Cheshire.

Calopterygidae.—On 12 May naiads of *Calopteryx virgo*, Linn. were dredged from Oberwater: while many appeared to be full grown, some were so small that they clearly would not be ready to emerge till 1923. The imago was seen on 16 June in the Forest. In August one was seen there on the 10th, two males were seen on the 11th and two more on the 15th: none were noticed afterwards.

Lestidae.—Stowell took *Lestes sponsa*, Hans., flying with *Ischnura elegans*, Lind., at Dymchurch on 20 August.

Agrionidae.—*Platynemesis pennipes*, Pall., with its variety *lactea*, Charp., was met with in the New Forest on 18 June. *Ischnura elegans* was taken at Dymchurch on 20 August (Stowell). Killington took a specimen on 16 Sept. with dull green (but distinctly green) thorax, and the eighth segment of the abdomen brownish-green. It seemed to be quite mature, if anything rather aged, and had quite a dusty appearance. Of *Agrion mercuriale*, Charp. a female was captured in the New Forest on 18 June, and a male on 21 June. The imago was bred in 1922 from the naiad by both Killington and myself. R. South took *Agrion puella*, Linn. at Thorpe-le-Soken, near Clacton, Essex, on 29 May. Males were swarming, but females were scarce on 11 June at Stanmore (Blair). It was met with on 16 June in the New Forest. R. V. Wadsworth took in June, over a pool near Hopwood in Worcestershire, males with aberrant markings on the first and second segments of the abdomen (v. *Ent.* lvi. p. 57, figure). *Erythronma naias* was emerging on 22 May at Hampton Court. Blair found it in fair numbers at Stanmore on 11 June: a few pairs were united *per collum*, but the males were in great preponderance. Of *Pyrrosoma nymphula* a female was taken in the New Forest on 11 May and a male on the 16th: on 24 May a crippled male was bred from a New Forest naiad; the imago was met with in the Forest again on 16 June. On 31 May a few were seen on Esher Common, and on 11 June Blair found the species in small numbers at Stanmore. *Pyrrosoma tenellum*, Vill., female, was met with in the New Forest on 18 June. South took *Enallagma cyathigerum* at Thorpe-le-Soken on 29 May. On 26 May it was in fair numbers at Esher Common, and was in plenty on the 31st. A fair number of males were seen at the Black Pond on 11 July, and it was noticed that the spot on the second segment of the abdomen was very variable. Males were found at the Black Pond on 22 Sept. and one again on the 28th. Although sought for, *Ischnura pumilio*, Charp. was once more not found in the New Forest.

As mentioned above *Agrion mercuriale* was bred in 1922. The naiad is small, but somewhat stout for its size, and the caudal lamellae are conspicuously short. In colour it is of a cloudy ochreous green. The markings of the abdomen seem rather distinctive. There is a broad dark brown mid-dorsal spot on each visible segment about one third the width of the abdomen, this spot being darkest at the base of the segment and shading off distally. Mid-dorsally a pale yellowish longitudinal line bisects the spots, which are also bounded laterally by a pale tint. Before emergence I was able to get a good coloured drawing of the living naiad.

Three cases of dragonflies with their prey are recorded by F. J. Killington:—*Calopteryx splendens*, Harris, at Eastleigh, Hants, on

28 May, with a Caddis-fly : *Pyrrhosoma nymphula*, at Eastleigh. on 29 May, with an Alder-fly (*Sialis lutaria*, Linn.) ; *P. nymphula*, at Beaulieu. New Forest, on 5 June, with a Green Lacewing (*Chrysopa perla*, Linn.).

Kingston-on-Thames,
20 January, 1923.

AN ENTOMOLOGICAL VISIT TO THE MORVAN (CENTRAL FRANCE).

BY A. E. BURRAS, B.A., F.E.S.

THE following account of a six weeks' holiday (July 29 to Sept. 15), spent in the middle of the Morvan, may be of interest to others who are seeking an entomological holiday somewhat off the beaten tracks. Our centre was the village of Moux (1200 inhabitants). This delightful little place lies at a height of 1500 feet above sea-level, in a valley surrounded by wooded hills and dominated by Mt. Moux, the highest mountain of the Morvan. Leaving the Gare de Lyons at Paris at 11.30 p.m., we reached Saulieu at 8 a.m. The 40 kilometres separating this place from Moux are traversed twice a day by a lilliputian train of advanced age, and corresponding slowness. Having missed the morning connection by about 20 minutes, we had perforce to await that of 5 p.m. However, we utilised the intervening hours as few but entomologists can. Having traversed the village, bathed in glorious sunshine, we turned down a narrow lane, and there on a small thyme-covered patch we spent the first few hours of our hunting. The following is a list of what we took or saw: *Leptosia sinapis* (in abundance), *Melanargia galatea*, *Gomphyrus rhamni*, *Colias hyale*, *Lycaena argiolus*, *L. arion*, *L. minima*, *Zephyrus betulae*, *Vanessa c-album*, *Araschnia lerana*, *Limnitis sibylla*, *Aphantopus hyperanthus*, *Pararge aegeria*, *Epinephele jartina*, *E. tithonus*, *Carcharodus alceae*, and *Adopaea thymas*, the 3 common whites, with a specimen each of *Bryophila muralis* and *B. perla*, picked up from the walls as we returned. Around these walls we found *Macroglossa stellatarum* flying in numbers, and under the copings hung various chrysalides, known and unknown, including fresh ones of *Oenieria dispar*. In the station, whilst waiting for the train, a freshly emerged specimen of *Cleora lichenaria* was picked from the railings. The last stage of our journey was made through most promising entomological country, beech-clad heights, great thymy swells, uncultivated flowery patches, great clumps of broom, moist valleys, rough scrub, granite escarpments, and mile upon mile of most glorious mixed woodland. Our first day was spent on the slopes of Mt. Moux. Our first day's selection from its teeming cornucopia included *Lycaena arion*,

Leucophasia sinapis, *Nomiades semiargus*, *Pontia daplidice*, *Melanargia galatea*, *Papilio machaon*, *Argynnis paphia*, *Melitaea cinxia*, *Melitaea didyma*, *Melitaea parthenie*, *Adopaea lineola*, *Ino globulariae*, *Lythria purpuraria*, *Fidonia limbaria*, *Heliothis dipsacea*, *Lithosia complanula*, *Ephyra porata*, *E. punctaria*, etc. This was not, I think you will agree with me, a bad beginning. *L. arion*, we found, was widely scattered, and to be taken wherever its food-plant was to be found. In form it was precisely similar to Devonshire specimens, and consequently much brighter than the forms usually taken in Southern France. The first specimens we took were getting somewhat *passé*: a fortnight later we took beautifully fresh examples of both sexes—evidently of a later brood. *L. sinapis* swarmed everywhere until the end of the month—near and in the woods—in the open meadows, and even on the bare hill-tops. Among them were some nice forms of the wholly white female. *M. galatea* was decidedly *passé*; the one passable example I retained is much darker than the usual English form.

P. machaon and *Pontia daplidice* were never exactly common, particularly the latter. This was not surprising, considering that its favourite food-plant was not in evidence at all. It was also exceedingly difficult to distinguish it, on the wing, from *Euchloe belia*, an insect which strongly resembles a female *E. cardamines*, and flies as though it regarded the devil as an entomologist. *Aporia crataegi* was represented in the imago stage by a single worn specimen. *C. hyale* was abundant, whilst *C. croceus*, on the other hand, was represented by about a dozen specimens. Of *L. sibylla* we saw several specimens, some in fair condition at the end of August, and this in a district 300 miles to the south of its English haunts. In fact, considering our latitude, most emergences seemed very late. Some, of course, were examples of second broods, but I doubt if this could be the case with many species I shall eventually mention. There seemed also to be a great deal of overlapping, and some species were out with the evident intention of making one's entomological calendar look foolish. *Apatura iris* was seen, but not taken, and so was *A. ilia*. Of *Vanessa polychloros* two specimens only were taken, and a few others seen.

I know this insect is fond of flying high, and basking in the sun on the higher branches. In the New Forest, for instance, I have frequently seen it more abundantly in the spring than in the following autumn. Owing to the habit above mentioned, I think we frequently overlook it. That glorious insect *Vanessa antiopa* has a somewhat similar habit, and is, in addition, a bit of a butterfly humorist. The ease with which it can just keep out of one's way seems little less than a piece of calculated impertinence. In the end, by careful restraint, we managed to take some half-dozen or so.

A. paphia, *A. cydippe* and *A. aglaia* were all to be taken in

excellent condition at the beginning of our stay. Of *A. cleodora*, the beautiful variety of *A. cydippe*, we took 5 or 6, and others we let go, as being somewhat *passé*. *Argynnis lathonia* was fairly plentiful and *Melitaea cinxia* abundant, as a second brood. A few second brood *Argynnis selene* were also seen. *Polygonia c-album* was not plentiful, although it was taken and seen in all stages. In fact, all the common English Rhopalocera to be seen at this season were abundant. Of the Hair-streaks we saw fewer than we expected. *Thecla quereus* was not abundant. *Zephyrus betulae* was represented by a few specimens and one stung larva.

The only other Theclid was a *Thecla ilicis* taken by my friend Mr. Fassnidge. Of the Blues, in addition to *L. arion* we saw *Lycaena astrarche*, *L. icarus*, *Cyaniris argiolus*, *Cupido minimus*, *Nomiales semiargus*, *Lycaena aegon*, *L. baton*, and *Everes argiades*. The last was difficult to take in good condition and was just going over when we arrived. *L. aegon*, on the other hand, was just coming out freely during the last week of our stay. Had we been less busy I think it would have repaid us to look over *L. aegon*, as among the few taken Mr. Fassnidge has one or two nice forms.

Of the Skippers we took or saw *Thanaos tages*, *Adopaea thauimas*, *Angiades sylvanus*, *Adopara lincola*, *Angiades comma*, *Hesperia sat*, *Carcharodus althaeae* and *Scelothrix alceus*. In addition to the butterflies already named, we took *Limenitis camilla*, *Argynnis dia*, *Satyrus briseis*, *Chrysophanus aleiphron* (var. *gordius*), and *C. dorilis*. Of other day-flying insects we took *Hemaris tityus* (note the date), *Sesia ichneumoniformis*, *Zygæna transalpina*, *Endrosa irrorella*, *Nudaria mundana*, *Emmelia trabealis*, *Prothymnia viridaria*, *Euclidia glyphica*, *E. mi.*, *F. limbaria*, *Calophasia lunula* and *Cloantha radiosa*. Searching telegraph poles and rails produced *Sphinx convolvuli* (over a dozen), *Acronycta psi*, *A. rumicis*, *Hecatera chrysozona*, *Polia chi*, *Cucullia umbratica*, *Catocala fraxini*, *C. nupta*, *C. sponsa*, *Boarmia repandata*, *Euphyia picata*.

Beating bushes and walking the rough grasses gave us *Ennomos quercinaria*, *Calymnia trapezina*, *Gnophos obscuraria*, *Pseudoterpna pruinata*, *Ephyra trilinearia*, *E. pendularia* (including two beautiful forms, almost white), *Acidalia humiliata*, *A. ochrata*, *A. rubiginata*, *A. subsericeata*, *A. unitaria*, *Timandra amata*, *Semiothisa notata*, *Selidosema ericetaria*, *Pachycnema hippocastanaria*, *Amorbe olivata*, *Aspilates gilvaria*, *Perizoma alchemillata*, *Eupithecia pulchellata*, *Xanthorhoe tristata*, *Anticlea rubidata*, *Coenocalpe vittata*, *Lygris pruinata*, *Lygris testata*.

Among the insects beaten out whilst larva hunting were *Sarothripa recayana*, *Drepna cultraria*, *Luceria virens*, *Lophopteryx camelina*, *Palimpsestis fluctuosa*, *Lymantria monacha*, *Agrotis linogrisea*; and picked up whilst lamping *Hepialus sylvinus*, *Lithosia lutarella*, *Cilix glaucata*, *Lasiocampa trifolii*, *Eupithecia oblongata*.

Sugaring and lamping were unfortunately curtailed through our inability to obtain carbide for the first ten days of our stay.

For our sugar we used a mixture of blackberry juice, French sugar and honey. So far as the Morvan is concerned the sugaring difficulty is simplified, as sufficient brambles can be gathered in ten minutes to supply the juice for several nights' sugaring.

The following is a list of what we took at sugar: *Thyatira batis*, *A. psi*, *A. rumicis*, *Leucania lithargyria*, *L. albipuncta*, *L. pallens*, *Xylophasia monoglypha*, *Cloantha perspicillaris*, *Leucania vitellina*, *Trachea atriplicis* (seen, but missed), *Cerigo matura*, *Luperina testacea*, *Barathra brassicae*, *Apamea secalis*, *Miana fasciuncula*, *M. strigilis*, *Caradrina morphews*, *C. taraxaci*, *C. ambigua*, *C. cubicularis*, *Agrotis puta*, *A. saucia*, *A. segetum*, *A. exclamationis*, *A. aquilina*, *A. obeliscus*, *Noctua plecta*, *N. c-nigrum*, *N. rubi*, *Agrotis nigricans*, *Noctua baja*, *Triphaena fimbria*, *T. comes*, *T. pronuba*, *Phlagophora meticulosa*, *Mamestra dentina*, *Mamestra trifolii*. It is interesting to note that I had seen many of the above species at sugar and in worn condition some weeks before I left for France.

Lamping over heather, etc., gave us, in addition to many of the species named above, *Stilbia anomala*, *Dianthoecia capsicola*, *Hecatera serena*, *Cucullia lactucae*, *Hyppena rostralis*, *Hyppena proboscidalis*, *Ophisthograptis luteolata*, *Selenia bilunaria*, *Crocallis elinguaris*, *Boarmia gemmaria*, *Ephyra porata*, *E. punctaria*, *Asthena candidata*, *Acidalia dimidiata*, *A. bisetata*, *Timandra amatoria*, *Acidalia aversata*, *Cabera pusaria*, *Abraxas grossulariata*, *Ligdia adustata*, *Mesoleuca ocellata*, *Hydriomena furcata*, *Xanthorhoe rivata*, *X. sociata*, *X. fluctuata*, *Anticlea rubidata*, *Coremia unidentaria*, *C. ferrugata*, *Anaitis plagiata*, *Malenydris salicata*, *Larentia vespertaria* (*parallelolineata*), *Acidalia rusticata*, etc., etc.

After the first fortnight we devoted our mornings largely to larva-beating. Owing to the configuration of the country the dew had rarely disappeared before 11 in the morning, and butterflies did not move much until after that hour. It is true that we had made a few preliminary nibbles with a stick and a Bignell, but nothing in the way of a concentrated effort. The first larva of note fell to Mr. Fassnidge in the shape of *Papilio podalirius* from blackthorn. This insect favours small bushes in exposed situations, and has a curious habit of suddenly appearing at the extreme end of a twig, evidently in order to bask in the sun. Some two dozen were obtained altogether.

Odd larvae of *Melitaea didyma* were to be picked up on the hillsides. Pupae of the same species were afterwards found in fair numbers suspended to the inner edges of the metals on the railway track. From the same situation were obtained odd pupae of *P. c-album* and *V. antiopa*. In places where the second brood of *M. cinxia*

was flying freely, nests of larvae were also to be found: the latter had evidently resolved to wait for another season. An odd larva, badly stung, of *Z. betulae* was beaten out of blackthorn. The only other species of Theclid in the larval form was *T. rubi* on broom. On the railway track above mentioned, which was a regular promenading ground for larvae, were also found the larvae of *Saturnia pavonia*, *A. rumicis*, *Diaphora mendica*, *O. dispar*, and *Macrothylacia rubi*. Many sallows showed evident traces of what must have been colonies of *V. polychloros*. The larvae of *Pyrameis atalanta*, *Pieris brassicae*, *P. napi*, were swarming. Those of *A. crataegi* were plentiful in their winter quarters, mostly on wild apple. Towards the end of the stay a few larvae of *P. machaon* were picked up and a few small *L. sibylla* were found by Mr. Fassnidge.

Signs of *Sesia culiciformis* were plentiful, and empty pupa cases of *Trochilium apiformis* were sticking in dozens from certain poplars. Larvae of *M. stellatarum* were plentiful on the bedstraw by the road sides. One morning I had the luck to beat a small larva of *Cerura bicuspis* from birch. On the following day, however, Mr. Fassnidge and myself each beat a larva of the same species from beech. In our subsequent searches some two or three dozen were obtained, all except the first from beech. We found them very widely scattered over some thousands of acres of beech woods. They seem to prefer the northern side of the upper parts of the hills, and are rarely to be found more than four feet from the ground, often quite close to it, in the thickest part of the foliage, preferably where it grows in low clumps.

In the same woods and from beech, be it noted, were obtained the larvae of *Smerinthus ocellatus*, *Hylophila prasinana*, *Atolmis rubricollis*, *Lithosia sororecula*, *Heterogena asella*, *Drepana lacertinana*, *D. cultraria*, *Stauropus fagi*, *Lophopteryx camelina*, *Drymonia dodonea*, *Phalera bucephala*, *Diptera orion*, *Demas coryli*, *Orgyia antiqua*, *Dasychira pudibunda*, *Ennomos autumnaria*, *E. erosaria*, *Pachys strataria*, *P. betularia*, and *Aglia tau*. On willow we found *Cerura furcula*, *Dicranura vinula*, *Scoliopteryx libatrix*, *Pygaera pigra*, *S. ocellatus*. On poplar *Notodonta tritophus*, *Palempsestis or*, and *P. octogesima*. On birch, in addition to *C. bicuspis*, *Acronycta leporina*, and a few which we took to be *Leucodonta bicoloria*. Alas, we shall never be really certain, as every one of them succumbed to the attentions of the ubiquitous ichneumon fly. Of the Sharks, we took the larvae of *Cucullia lychnitis* and *C. absinthii*.

As Golden Rod was plentiful in some of the woods, we had visions of *C. gnaphalii*: our visions, however, failed to materialise, though we obtained a few tiny larvae of *Eupithecia virgaureata*.

In addition to the larvae already mentioned, we obtained from various places those of *Orgyia gonostigma*, *Cidaria miata*, *C. siterata*, *Eurymene dolobraria*, *Hipoerita jacobaeae*, *Spilosoma menthastri*,

Euproctis chrysorrhoea (in winter quarters), *Cilix glaucata*, *Dianthoecia capsicola*, *Anarta myrtili*, *Chesias rufata* (plentiful by night on broom, and to be beaten in small numbers by day from the lower branches, where it hides), and *Acronycta aceris*.

Besides the various Macro-Lepidoptera which have been mentioned, we also took the following species of the Micro-Lepidoptera: *Cledeobia angustalis*, *Pyralis farinalis*, *Pyrausta purpuralis*, *Herbula cespitalis*, *Ennychia nigrata*, *E. octomaculata*, *Botys ruralis*, *Spilodes verticalis*, *Pterophorus monodactylus*, *Oxyptilus parvidactylus*, *Leioptilus osteodactylus*, *Acipitilia tetradactyla*, *Crambus myellus*, *C. selasellus*, *Ilithia semirabella*, *Peronea cristana*, *Aspis udmanniana*, *Depressaria costosa*, *Harpelia forficella*, *Scardia boleti*, *Crambus tristellus*, *Rhodophaea tumidellus*, *Peronea sponsana*, *Crambus inquinatellus*, *C. falsellus*, *Phycis ornatella*.

For naming many of the above I have to thank Mr. F. C. Woodforde, B.A., F.E.S., of the Hope Museum, Oxford.

We took some 2000 specimens, exclusive of the Micro-Lepidoptera, and this in a season which, according to reports from various districts, has been declared to be a very bad one for the continent. The above numbers comprise 260 species of Macro. and 26 of Micro, exclusive of some dozen species of the latter which we have as yet failed to identify.

In fact we were only able to pick out a currant or two from this entomological plum-cake. I am sure that a generous banquet awaits those who have leisure and inclination to stay longer at the feast. It is a country of unexplored possibilities. The manifold variety of the wild-cat and wild boar haunted forests, the untrammelled freedom of the flowery hills, the thousands of acres of its woods and valleys, untouched and unexplored, lie open to the entomological pioneer. For those in search of hunger or of health, for those poor in pocket, but rich in hope, I can heartily recommend the Morvan, and can assure them of a hearty welcome from mine host of the Hotel de la Poste, at Moux.

NOTES AND OBSERVATIONS.

UTETHEISA (DEIOPEIA) PULCHELLA, L.: *In Gloucestershire*.—I have pleasure in recording the capture by my son, David G. Clutterbuck (aged 10), of a male Crimson Speckled Footman Moth, *U. pulchella*, in a Severn meadow about two miles from Gloucester. It was flying in the afternoon sunshine at 3.45 p.m. (summer time), with a strong south-west wind behind it, on the 7th May, 1923. After a chase of about 50 yards the insect, which resembled a pale Geometer on the wing, turned to the right and darted down into the grass, from which it was promptly boxed. Unfortunately in securing it the tip of its right antenna was broken off, but otherwise it is in fresh condition. There had been a thunderstorm overnight, following three fine hot days,

and judging from condition the specimen is a native and not an immigrant. Apparently an exceptionally mild winter and an early spring had assisted and expedited its development. A search through the volumes of the Entomologist reveals the fact that this is probably the earliest date for the capture of this species in a wild state in this country. Barrett (vol. 2, p. 242) states—"has been observed in July and August and very rarely in May and June." Wood's Index Entomologicus, 1839 edition, contains a good figure (No. 95, Pl. 8), and gives September as the time of appearance. The only previous record for Gloucestershire appears to be in Mr. V. R. Perkins' manuscript list, where he says, "a fine male specimen was taken in a garden at Bishopston near Bristol, 10th Sep. 1871, J. B. Jarvis, Entom. v, 414."—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, 7th May, 1923.

In Sussex. If Dr. E. Miskin, of Brighton, and a recruit to entomology, has not reported, I wish to say I was in his company on the Downs on Friday, 4th May, and saw him take a freshly emerged specimen of *Detiopoia pulchella*. This insect is known here, being formerly taken on a bank near Bevendean (now ploughed up). A specimen was taken at rest on the Barracks wall, Lewes Road, Brighton, some few years ago. The winter has been mild and the spring emergence has got through it seems. F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

PYRAMEIS ATALANTA IN APRIL.—On Easter Monday, April 2nd, I observed a good specimen of *Pyrameis atalanta* at a road corner near Hurn (Bournemouth). At the same spot were two *Gonepteryx rhamni* and a Small White playing in the sun. In view of Mr. South's statement—"this butterfly does not appear in the spring with the other hibernating species," the occurrence seems interesting. Last year, I see from my diary, I observed *P. atalanta* in the Talbot Woods on Boxing Day. J. N. FLETCHER; Royal Air Force, Netheravon, Wilts.

BUTTERFLIES AT BUDE.—Spring has been phenomenally early at Bude this year. *Pararge aegeria aegerides* was actually seen in the warm valley at Coombe near here on 23rd March and taken near Bude on 1st and 2nd April. On April 3rd *Pieris brassicae* and *Lycaenopsis argiolus* were seen.—P. P. GRAVES; Penrowan, 10, Down View, Bude, Cornwall.

HELIOTHIS PELTIGERA IN JANUARY.—In connection with your note* on *Heliothis peltigera* in North Wales in March, I may mention that I netted, on the very warm night of Jan. 20th, 1918, a moth as it careered about my room, attracted by the light, which I found, much to my surprise, to be of this species. The fact was recorded in vol. xl (1919), p. 73, of Proc. Dorset Nat. Hist. and Ant. Field Club. The specimen was quite a good one. F. H. HAINES; Brookside, Winfrith, Dorchester, Dorset, May 3rd, 1923.

EARLY EMERGENCE OF NEMEOBIUS LUCINA.—On Friday, 4th May, I was rambling in Surrey and was much surprised on taking a series of *N. lucina*. The weather was unusually warm for the time of year, but even considering this, it seems an extraordinarily early date

* Ent., lvi, p. 114.

for this species. I also took a nice series of *Callophrys rubi* besides the usual spring insects—*Hesperia malvae* and *Euchloë cardamines*.—A. E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

A NEW EGYPTIAN NEMOPTERID (NEUROPTERA).—I should be glad if you would kindly publish the following preliminary description of a new genus and species of Nemopterid, a fuller description of which will appear later in the *Trans. Ent. Soc. London*: **Pterocroce** gen. n. (near *Nina* Navas), genotype **storeyi** sp. n. ♂ with bulla in fore wing, hind wing simple and filiform. ♀ with both fore and hind wings, simple and entire. Venation in both sexes uniformly testaceous. *Hab.*—Cairo, Egypt.—C. L. WITHEYCOMBE, Imperial College of Science, S. Kensington.

LEUCOPHAEA SURINAMENSIS, LINN., ETC. (ORTHOPTERA).—Mr. G. Fox-Wilson asks me to make the following record: On 5th July, 1922, he found several specimens, imagines and nymphs, of *Leucophaea surinamensis*, Linn., in a cucumber house at West Byfleet in Surrey. Apparently they were doing damage to the cucumber plants. In company with them were imagines and nymphs of *Periplaneta americana*, Linn. Large numbers of *Gryllus domesticus*, Linn. were also found in the same houses, where they had done much damage. —W. J. LUCAS; 9th May, 1923.

RHYSSEA PERSUASORIA, LINN.—Last year when collecting in mid-June in some woods beyond Lewes I took a specimen of the Ichneumon fly *Rhyssa persuasoria* and saw two others, but could not get them. The one I captured had the whole of its ovipositor down a hole in a dead larch bough. As there were several holes I cut open the one in which the insect had had its ovipositor and found it contained a fair-sized beetle larva. I have been told the insect is not common. —F. F. WOOD; Eastons, Ditchling, Hassocks, Sussex.

THE USE OF THE NAME SALMACIS, STEPHENS. —However desirable the use which Mr. Carter and Dr. Harrison have made of the name *salmacis* may be, it is, unfortunately, quite *ultra vires*. If Stephens had only described one sex, specimens "coinciding in everything except sex" with that description would naturally be included, but since the author definitely states that the ♂ of his *salmacis* has a black, and the ♀ a white discoidal, the ♂ with a white discoidal is ruled out, and was left nameless by Stephens. The fact that this logic does not commend itself to the writers in your last issue (though they make no attempt to refute it) cannot lessen its cogency. On the other hand, their argument in the last two sentences of the second paragraph beginning on p. 108 is certainly of the nature of a *non sequitur*, since all that is true of a species is by no means necessarily so of a variety. In the present case if the ♀ with white discoidal would only pair normally with the ♂ with white discoidal, the argument would be sound, and *salmacis* would be a *species* with white discoidal in both sexes, and Stephens would merely have assigned the ♀ of one species to the ♂ of another; but as the various forms of *A. medon* pair indiscriminately, the specific name *medon* refers to all forms alike, but the varietal name *salmacis* must be applied in accordance with the original description, or (as an

alternative) the law of priority must be scrapped. I am abroad at the moment and all my papers are in store, but, speaking from memory, I think that on my return I could lay my hand on a letter from Dr. Harrison, admitting the necessity for the "grotesque nomenclature" of which he now complains. Grotesque it may be, but the blame for its necessity must be shared between Stephens and the law of priority. —GEORGE WHEELER; Florence, May 6th, 1923.

A NOTE ON LIPTENA IMMACULATA STAUD. (LEP. RHOPAL. FAM. LYCAENIDAE). Mr. W. Hawker-Smith, who is arranging the $\frac{7}{4}$ Liptenniae at the Hill Museum, has called my attention to the name *immaculata* Staud. as being of doubtful validity. This name is retained by Prof. Aurivillius for a species of Liptena, which Staudinger wrongly identified as the ♀ of *Deloncarea immaculata* Trimen. As this Liptena had previously been named by Holland as *xanthis*, this name must stand to represent the species. Aurivillius has pointed out in his Rhop. Aethiopica under *Deloncarea* that Staudinger's specimen belonged to a Liptena. As Aurivillius has not altered the name in Seitz, and no mention is made there of Holland's species, we think a correction is necessary. It may be added that the type of *Deloncarea* is a ♂. The species should be known as *Liptena xanthis* Holland, Psyche 5, p. 429 (1890) (Ogowe R.), with synonymus *Deloncarea immaculata* Staud. (nec Trimen, ♀ err.), Exot. Schmett., 1, p. 268, t. 94 (1887-1888); *D. immaculata* Röber (nec Trimen), Staud. & Schatz, Exot. Schmett., 2, p. 280, t. 50 (1892); *Liptena immaculata* Auriv. (nec Staud.), Rhop. Aethiop., p. 278 (1898), Seitz Macrolep., xiii, p. 334 (1920). G. TALBOT, The Hill Museum, Witley.

VARIATION IN LEPIDOPTERA. Mr. George T. Porritt seems surprised that nobody has questioned my statement touching the original hues of the Lepidoptera; yet I fail to see how any follower of Darwin, or anyone who has examined such more recent fossil Lepidoptera as have retained their pattern and colouring, can come to any other conclusion. Not only do *Necropsis sepulta*, the most distinctly coloured fossil butterfly, and *Lithopsyche antiqua*, the most clearly defined fossil moth, exhibit these sombre hues, but their nearest allies at the present day retain the same character of colouring (cf. "Lepidoptera Exotica," pl. xlviii, and Proc. Zool. Soc., 1889, pl. xxxi). Even *Palacontina oslitica*, which is too ancient to have retained any trace of pattern or colouring, is proved by its neurulation to be related to *Dasyphthalma*, a genus of black butterflies crossed by creamy white bands. The bright colours of many Lepidoptera, as Darwin points out, have been developed either by sexual selection or for protective purposes: in the former case the male colouring has been first modified in order to render him more attractive to his mate: in the latter the female has been specially dealt with to render her inconspicuous to her enemies. Too much has been published in proof of protective assimilation to permit any reasoning being nowadays to believe that all animals were originally created as they now are.* Where structure has been greatly modified one can

* Frohawk's illustrations in The Field for May 20th, 1905, p. 853, show many well-known examples of mimicry among British Lepidoptera.

understand that reversion to the ancestral type may be difficult, if possible, but when it is a mere question of colour I don't see where the difficulty comes in: a moist warm season may produce many melanistic reversions, or a cold dry season, by lessening the supply of nourishing food and weakening the larvae, may produce albinistic examples.

What evidence has Mr. Porritt that Lepidoptera have been constant in form and have not reverted to ancestral types for thousands of years? Seeing that no two specimens of any species are absolutely identical in every detail, whereas the variations which occur in many of them are quite startling, I should say that he has none whatever. Why also does he assume that "plants, animals (he probably means mammals) and even man" never revert to an ancestral type? Has he never seen that delicate and (in my experience) short-lived flower the pure white wild primrose? Black, pied and white forms of many kinds of animals turn up from time to time, and man, when he is born a congenital idiot, is recognisable at once as a reversion to the ape type. Who told Mr. Porritt that the conditions of life are pretty much the same as they have been for thousands of years, that melanism is a very recent phenomenon, or that none of the causes yet suggested for it could possibly have been in operation in ancient times? Will he kindly give his authority for these statements?—A. G. BUTLER; 124, Beckenham Road, Beckenham, Kent.

HEAD-TRANSPLANTATION IN INSECTS.—In view of the sensational accounts which have appeared in the daily press, and elsewhere, of the extraordinary results said to have been obtained by changing the heads of living insects, the following free translations of the original notices by W. Finkler,* which recently came into our hands, may not be without interest:

Communications from the Biological Experimental Institute of the Vienna Academy of Science. No. 63. Head Transplantation in Insects: 1. Functional Capacity of Transplanted Heads. By Walter Finkler.

I have applied Przibram's transplantation method to the replacement of entire insect heads. The head is pulled out from the thoracic socket, separated by an oblique cut from behind, and replaced on another similarly treated animal. The outer edges of the wounds are closed by the blood, which only overflows to a small extent during narkosis, and the head is held in a position favourable for healing. Stitching and other artificial methods of fixation are thus dispensed with, as the transplanted part fastens itself to the trunk by contact.

Successful transplantation experiments were carried out with (1) the imago of *Hydrophilus piccus*, (1a) *Dytiscus marginalis*, (2) species of *Notonecta*, (3) the imago and larva of *Dixippus morosus*, (4) larvae of *Tenebrio molitor*, and (5) pupae of *Vanessa io* and *urticae*.

To test the functional capacity of the transplanted heads con-

* Anzeiger Akad. Wiss. Wien, liii, pp. 157-158, 1921.

ditions in beheaded insects were next examined. A decapitated *Hydrophilus* is incapable of any co-ordinated movement. It has no power of locomotion either in water or on land. The movement of decapitated stick-insects is very obviously different from that of normal specimens. Whilst normal stick-insects use each pair of legs for movement in a forward direction, a decapitated stick-insect, on stimulation, steps out in a forward direction with the first pair of legs, in a backward direction with the last pair. The middle pair act as supports. That this result was not due to shock is proved by the following experiment: Insects from which the head has been removed but in such a manner as to leave the cerebral and oesophageal nerve-centres still in position, act, as regards swimming, in a perfectly normal manner.

The insects with transplanted heads were kept in a damp chamber until co-ordinated movement occurred, which was in about two or three weeks. During the first week a sealing membrane forms between head and thorax. After one or two months the head completely regained its functional capacity. The water beetles swim freely into deep water; they eat and defaecate. All the characteristics of the decapitated insect have disappeared.

Macroscopically the complete union of the head can readily be seen in a section. The histological investigation remains for a further communication.

No. 64. Head Transplantation in Insects: 2. Exchange of *Hydrophilus* heads between male and female. By Walter Finkler.

In the first communication the possibility of transplanting the heads of insects was described. This exchange can also be carried out between the different sexes (xenoplastic transplantation). It should now be proved what are the conditions of the sexual instincts in insects operated on in this manner. The normal male of *Hydrophilus piceus* in preparation for copulation clings firmly to the thorax of the female with its first pair of legs, whilst its last pair of legs securely hold the swimming feet of the female, and the middle pair remain free and serve for the purpose of gentle locomotion. The female remains passive.

The heads were exchanged of males and females which had been kept separate. After the healing was complete, the insects were placed, in various sex combinations, two each in a vessel with water and further observations made:

(a) Females with male heads performed the above mentioned preliminary movements for copulation, that is to say behaved as if they were males, and indeed caught and held purely female specimens. By normal males they were treated as females.

(b) Males with female heads in respect to both sexes—like normal females—remained quite passive. Nor was a preparative movement for copulation observed. Normal males remained indifferent to them.

If these accounts are a true statement of fact—and we have no reason to doubt them—the experiments should be capable of repetition any number of times.

N. D. R.

WICKEN FEN FUND.—This fund is raised annually by entomologists to assist in defraying the expenses incurred by the Custodian of Wicken Fen, the National Trust, in administering and preserving the Fen, and in providing a watcher to protect the plants and wild life dwelling therein. Contributions are earnestly solicited; they should be sent to the Hon. Treasurer, W. G. Sheldon, West Watch, Limpsfield, Surrey.

RECENT LITERATURE.

Entomology, with Special Reference to its Ecological Aspects. By JUSTUS WATSON FOLSOM, Sc.D. (Harvard). Third Revised Edition. vi + 502 pp., 5 pls., and 308 text-figures. London: John Murray (printed in U.S.A.), 1923. Price 21s. net.

THE third edition of Dr. Folsom's book contains much new matter in addition to that of the second edition. The work is an exceedingly valuable one to the student of Entomology who requires a good foundation in general principles, and more especially in the biological side of his subject. The book is well written, concise and in clear style. Much ground is covered in the limited number of pages, and although such treatment necessitates skimming briefly over some points, a very full bibliography furnishes the reader with references to works containing more detailed information when required.

The second edition contained a new chapter on the transmission of diseases by insects. The present edition has an additional chapter on Insect Ecology. In this an account is given of the influence of environment upon insects—a much neglected though important subject. The chapter is necessarily only a short *résumé* of research accomplished up to the present time in this direction, but together with the appended bibliography to the chapter one should be able to form a fair idea of the extent of the subject and the lines along which further investigation is desirable.

Although primarily intended for American students, and with references mainly to common North American insects, yet the book will be found a valuable one to all entomologists, the subject-matter being generally applicable.

The Natural History of Wicken Fen. Edited by G. STANLEY GARDINER, F.R.S., and A. G. TANSLEY, F.R.S. Part I. 8vo. Pp. 64, 1 Map, 3 Text-figures. Cambridge: Bowes & Bowes, 1923.

THIS small publication, which it is proposed to issue in a series of parts at intervals, the whole to form one volume, is mainly composed of a long and most interesting account by A. H. Evans of the Fens of the Great Level, of which Wicken Fen forms part, their drainage, and its effect on the fauna and flora. Of particular interest to Entomologists is an account of the Lepidoptera of Cambridgeshire by W. Farren. The author has not attempted a complete list, yet presents a very full account of the more characteristic species of the

district. The extinct *Heodes dispar* is referred to as well as many other species which no longer occur in the country, and especial attention has been devoted to the rarer and more occasional visitors, and to the more recent additions to the fauna. We notice, however, that no mention is made of *Thamnonoma brunnata*, Thunbg., a specimen of which was captured at Wicken within the last year or two by the Rev. A. P. Wickham.

From the Periodicals.

A publication valuable especially to British Entomologists, and perhaps not very generally known, is the *List of Papers bearing upon the Zoology etc. of the British Isles*, compiled by T. SHEPPARD, and published by the British Association for the Advancement of Science. Zoology occupies the bulk of the volume. The papers are listed alphabetically under authors, but only the bare titles are given. This alone, however, for the year dealt with (1921) occupies some 44 pages.

Of a similar nature, but rather more detailed and confined to Entomology, is *Bulletin No. 139 of the Agricultural Research Institute, Pusa*, compiled by the Imperial Entomologist. In this the years 1920-1921 are dealt with. From the same source as this last we have received the Report of the Imperial Entomologist for 1921-1922. Of the *Catalogue of Indian Insects*, Part 3 *Bombyliidae*—by R. SENIOR-WHITE, is also to hand.

The current number of the *Annals of Tropical Medicine and Parasitology* contains several articles of an entomological nature, including a short paper by F. W. EDWARDS on *Ceratopogonine Midges attacking other Insects*, in which the literature of the subject is summarised to date and several new instances recorded.

To students of the difficult genus *Hesperia*, the second of SKISSEK and WILLIAMS' papers on the N. American Hesperidae (*Trans. Am. Ent. Soc.*, xivii, pp. 283-306, 1923) should prove of interest. The genitalia of all the species of *Hesperia* occurring in America north of Mexico are figured, and their systematic arrangement placed on a sound footing. This should be of considerable assistance to European Lepidopterists in identifying the New World forms.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 4th, 1923.*—Mr. E. E. Green, President, in the Chair.—

Election of Fellows.—The following were elected fellows of the Society: Mr. G. F. Gee, Mouldsworth, near Chester; Mr. J. B. Hicks, 99, Barkston Gardens, S. Kensington, S.W. 5.

Exhibitions.—Mr. Thos. Greer, a visitor, who expressed his thanks for the opportunity given him of attending the meeting, exhibited a number of Lepidoptera from East Tyrone. Mr. N. D. Riley exhibited and described a new Satyrid butterfly from East Africa. Mr. F. D. Morice exhibited and made remarks upon a rare British hymenopteron, *Pseudogonolus hahni*, Spinola. Mr. H. J. Turner exhibited examples of *Colias behri*, Edw., from the Yosemite Park at 9700 ft.—S. A. NEAVE, *Hon. Sec.*

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[No. 722

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDAE.

By G. T. LYLE, F.E.S.

No. 7.—CHELONIDAE.

THIS subfamily appears to be well represented throughout the world, the species showing a great similarity of structure. Our British examples are but little known and far from easy to identify. No doubt the group is very closely allied to the *Sigalphidae*, but I consider Ashmead's statement that it is separated therefrom only by having three cubital cells in the fore wings to be too sweeping; it is true that the genus *Phanerotoma* forms, more or less, a connecting link, but even so the differences are still very considerable.

The subfamily may be recognised by the following characters: abdomen sessile, first three segments united, usually without visible sutures, rarely with two superficial sutures, remaining segments concealed, or rarely subexserted. Fore wing with three cubital cells, radial cell short. Terebra concealed or slightly exserted (excepting in *Acampsis*).

It was formerly supposed that these insects were parasites of *Coleoptera*, but this is now discredited; it is extremely probable that they prey exclusively on larvae of *Lepidoptera*. Four genera are found in Britain; easily separated as follows:

- (4) 1. Abdomen above not divided into segments.
- (3) 2. First cubital cell not separated from first discoidal *Chelonus*.
- (2) 3. First cubital separated from the first discoidal *Ascogaster*.
- (1) 4. Abdomen above showing three or four segments.
- (6) 5. Recurrent nervure interstitial or falling into the second cubital cell *Phanerotoma*.
- (5) 6. Recurrent nervure falling into the first cubital cell *Acampsis*.

Sphaeropyx irrorator Fab. has for long been included in the British list, probably on the strength of five specimens, so named, in the Hope Museum Collection at Oxford. Prof. Poulton has very kindly sent me these insects for examination and I find them all to be *Ascogasters*; this I expected, for Marshall and Fitch saw one of them years ago and decided that it was an *Ascogaster* (see Trans. Entom. Soc. 1885, p. 151).

GENUS 1. *Chelonus*, Jur.*

The nomenclature is even now in great disorder in spite of the work done by Marshall and Szeplegiti to clear things up. So far as I can judge Reinhard merely made matters worse, and I regret to say that I cannot identify with certainty any of Thomson's numerous new species (*Opus Ent.*, vi. 563), though no doubt some of his descriptions relate to insects which are found in Britain. The genus may be recognised by the following characters:

First cubital and first discoidal cells confluent, the first abscissa of the cubitus being absent. Nervellus post-furcal. Recurrent nervure interstitial. Intermediate tibiae straight. Abdomen above without visible sutures.

In set specimens the terebra is sometimes visible, though in most cases it disappears beneath the carapace in consequence of the collapse of the underpart of the abdomen. It has been suggested that the shape of the third abscissae of the radius might be a help in classification, but I find this nervure to be anything but constant in shape, and have often noticed that the vein in the right wing of a specimen differs from that in the left.

Marshall's tables, one for males and another for females, are rather difficult to follow, and I have found Morley's table (*Entom.*, xl, p. 180) to be much more helpful. I have endeavoured to classify the species principally according to size, and although well aware of the many objections to this method and of the many imperfections of the table I append it for what it may be worth; if possessing no other merit it can certainly claim simplicity.

- (8) 1. Species with a length of at least $4\frac{1}{2}$ mm.
- (7) 2. Abdomen entirely black above or black with two yellowish spots.
- (4) 3. Hind femora mainly black *speculator*, Marsh.
- (3) 4. Hind femora mainly rufo-testaceous.
- (6) 5. Metathorax quadridentate *inanitus*, L.
- (5) 6. Metathorax bidentate *submuticus*, Wesm.
- (2) 7. Abdomen mainly rufo-testaceous above *wesmaelii*, Cur.
- (1) 8. Species with a length of less than $4\frac{1}{2}$ mm.
- (34) 9. Length 3-4 mm.
- (25) 10. Hind femora entirely black.
- (14) 11. Antennae of male with at least 32 joints, of female with at least 28.
- (13) 12. Radius of hind wing sinuate *carborator*, Marsh.
- (12) 13. Radius of hind wing almost straight after usual basal curve *catulus*, Marsh.
- (11) 14. Antennae of male with less than 30 joints, female with less than 28 joints.
- (16) 15. First joint of hind tarsi pale at base *corvulus*, Marsh.

* Hym., 289 (1907).

- (15) 16. Hind tarsi unicolorous, piceous or blackish.
 (20) 17. Hind tibiae entirely dark.
 (19) 18. Metathorax dentate at hind angles only . *contractus*, Nees.
 (18) 19. Metathorax quadridentate, acutely dentate at hind angles and obtusely on either side of base *risorius*, Rein.
 (17) 20. Hind tibiae partly testaceous or rufo-testaceous.
 (24) 21. Hind tibiae dark at apex only.
 (23) 22. Flagellum unicolorous dark . . . *secutor*, Marsh.
 (22) 23. First joint of flagellum testaceous . . . *latrunculus*, Marsh.
 (21) 24. Hind tibiae dark at both extremities . . . *sulcatus*, Nees.
 (10) 25. Hind femora partly testaceous.
 (29) 26. Abdomen entirely black.
 (28) 27. Male antennae 22-24-, female 18-jointed . *canescens*, Wesm.
 (27) 28. Male antennae 27-, female 16-jointed . *paricornis*, Schaff.
 (26) 29. Abdomen partially yellow.
 (31) 30. Basal third of abdomen entirely pale yellow *gravenhorstii*, Nees.
 (30) 31. Abdomen with two yellow basal spots only.
 (33) 32. Antennae of female 27-jointed . . . *decorus*, Marsh.
 (32) 33. Antennae of female 16-jointed . . . *dispar*, Marsh.
 (9) 34. Length less than 3 mm.
 (38) 35. Abdomen immaculate, black.
 (37) 36. Post scutellum elevated into a tubercle . *pusio*, Marsh.
 (36) 37. Post scutellum not elevated . . . *exilis*, Marsh.
 (35) 38. Basal third of abdomen yellowish . . . *basalis*, Cur., ♀.

(To be continued.)

PERONEA HASTIANA, L.: ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from page 131.)

(8) *hastiana*, L.

Synonymy.—Linné, Syst. Nat. edn. x, p. 532, No. 222 (1758); Clerck, Icones, pl. ii, fig. 7 (1759); Linné, Faun. Suecica, p. 346, No. 1328 (1761); Fabricius, Syst. Ent. p. 650, No. 26 (1775); Id., Syst. Ent. tom. iii, par. ii, p. 261, No. 79 (1794); Trietschke, Schmett. von Europa, viii, p. 266 (1830); Wood, Index Ent. No. 1072 (1839) (*coronana*); Wilkinson, Brit. Tort. p. 171 (1859); Stainton, Manual, vol. ii, p. 233 (1859); Staudinger, Cat. Lep. Eur. ii, No. 553 (1861); Id., Cat. Lep. Eur. ii, No. 682 (1871); Heinemann, Schmett. Deutsch, i, p. 14 (1865); Millière, Micr. Lep. des Alpes Maritimes, p. 68 (1875); Frey, Lep. Schweiz. p. 281 (1880); Snellen, Vlind. Ned. Micr. pp. 177-180 (1882); Sorhagen, Klein. Schmett. Brand. p. 64 (1886); Meyrick, Brit. Lep. p. 521

(1895): Staudinger, Cat. Lep. Pal. ii. p. 80, No. 1446 (1901): Barrett, Brit. Lep. x. p. 224 (1905): Kennel, Pal. Tort. pl. iii, fig. 33, and p. 71 (1908) (*coronana*): Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Original description.—*Tortrix* alis superioribus fuscis; fascia antrorsum obliqua alba. Habitat in Salice. Reinb. Hast.

Fascia non tangit marginem interiorum alae et a summo descendit antrorsum Hast. (Reinb.) Fenno, natus ad insectorum historium, at in flore aetatis periit egregius discipulus (Linné, *Lc.*).

Fortunately there can be no doubt what the typical form of this species is, for in addition to Linné's description, Clerck figured the type-specimen, which is still in Linné's Collection at the Linnaean Society's Rooms in Burlington House. The specimen agrees in every way with Linné's description and Clerck's figure. It is of large size and in bred condition: looked at in an ordinary light the dark portions of the superiors appear to be black: but if one holds the drawer containing it up to a strong light it is seen at once that they are the dark reddish-brown of the tint that obtains in so many forms of the species.

Typical *hastiana* is by no means rare in Britain, although it is certainly not abundant: I have it from Kent, Wimbledon, Lancashire, and Lochinver: and in 1921 I bred a considerable series of very beautiful and richly coloured examples from Invershin in East Sutherlandshire. On the other hand I have not bred a single specimen from several hundreds of larvae obtained at Wicken.

(9) ab. **subhastiana**, n. ab. (Plate 2, fig. 2.)

Similar to the type, except that the paler markings of the superiors are suffused with grey: the darker portions are very dark fuscous—in fact almost black. By reference to the figure the form will be recognised. It is not uncommon on the Lancashire and Cheshire Sandhills, and I have examples of it from Lochinver, Invershin, and Wicken. The type, an exceedingly dark specimen, was bred from a Wicken larva.

(10) ab. **subfasciana** n. ab. (Plate 2, fig. 11.)

Synonymy.—Kennel, Pal. Tort. pl. iii, fig. 30, and p. 71 (1908) (*coronana*).

I give this name to an aberration very similar to ab. *byringerana* Hüb. except that the lighter portions of the superiors are suffused with grey, and not white as in that form: the dark shoulder-mark on the inner margin, near the base, which appears in many of the aberrations of *hastiana*, is very prominent in this form. The figure

gives a good idea of the type-specimen, but the pale fascia and other pale markings contrast too strongly with the darker ones and appear nearly white. *Ab. subfasciana* is one of those forms which are difficult to deal with : specimens are found of all degrees of depth of grey suffusion, from those of almost unicolorous leaden type to examples almost as white as *ab. byringerana*. One cannot have names for all ; the only practical way seems to be to group them under one name.

These forms are common in certain localities in the North ; the type came from Lochinver, and I have specimens from Invershin and Rannoch.

(11) *ab. ruffasciana* n. ab. (Plate 2, fig. 12.)

Synonymy.—Kennel, Pal. Tort. plate iii, fig. 34, and p. 71 (1908) (*byringerana*).

This aberration is similar to the last in all respects, except that the pale fascia is suffused with a red flush ; this is indicated in the figure by the dark shading in the centre of the fascia. It is not common, but I have examples from Wimbledon, Kent (quite a number), the Isle of Wight, Rannoch, Lochinver and Soyea ; the type was bred from a larva obtained at the last-named locality.

(12) *ab. metallicana* n. ab. (Plate 2, fig. 9.)

I give this name to an aberration with a metallic patch of leaden appearance in the pale transverse fascia ; this is very discernible in the figure. In the type the darker portions of the superiors, including the triangular blotch on the costa, are light reddish brown, and the paler portions light grey ; the dark shoulder-mark is well defined. This very striking and remarkable form I have found to be very rare ; I have one example from a Kentish locality, and two others, including the type, from Wicken ; I have seen several others from the last-named locality.

I now come to a form, or rather a series of forms, varying infinitely *inter se*, but without characters of sufficient prominence and constancy to enable one profitably to differentiate them. Really one might give a name to almost each example if one wanted to name all the forms—and they are amongst the most numerous in every locality where the moth is found—but obviously such a proceeding would be absurd, and extremely mischievous. I propose therefore to include all of them under two names, *abs. variegana* and *griseana*. The forms in question are those dull-coloured examples having the light transverse strigae and other

markings of variable shapes and prominence, but always only slightly lighter than the dark portions of the superiors, and with the dark shoulder-mark not so noticeable as in the last three aberrations.

(13) ab. **variegana** n. ab. (Plate 2, fig. 6.)

Synonymy.—Wood, Index Ent. No. 1073 (1839) (*byringerana*). Westwood, Brit. Moths, ii, pl. xciv, fig. 5, and p. 158 (1845) (*byringerana*); Barrett, Brit. Lep., x, pl. cccliii, fig. 1 (1905) (*hastiana*); Kennel, Pal. Tort. pl. iii, figs. 27 and 28 (without name), fig. 29, and p. 71 (*coronana*) (1908); Spuler, Schmett. Eur. pl. 83, fig. 4, and vol. ii, p. 241 (1910) (*coronana*).

The name *variegana* is intended to include all those dark reddish-brown examples having the light transverse strigae and other markings only slightly lighter than the darker portions of the superiors, but not having the prominent dark shoulder-mark obtaining in ab. *subfasciana* and the two following aberrations. The characters of the specimen I have taken as the type can be arrived at from the figure, but Mr. Turner-Clark's admirable photograph shows up the lighter portions of the superiors more strongly than these are found in the specimen figured. Briefly to describe this specimen, which may be taken as fairly representative of the bulk of the examples of this group of forms, the whole of the superiors are reddish brown, the lighter portions only slightly paler than the darker ones.

Ab. *variegana* forms occur abundantly in all the localities where *hastiana* is found, so far as my experience goes. In some localities they out-number all the other forms combined. The type is from Lochinver.

(14) **griseana** n. ab. (Plate 2, fig. 7.)

Similar in all respects to the last except that the whole of the superiors have shades of grey instead of red brown. Again in this figure the light portions of the superiors show up more distinctly than in the specimen figured. I have examples from Kent, Wicken, Lancashire, Lochinver, and Invershin. The type is from Lancashire.

Scabrana Group.

Included in this group are two aberrations, differing in a prominent character from all the other *hastiana* forms. The character I allude to is the dark fuscous base, contrasting remarkably with the paler remaining portions of the superiors.

(15) ab. *scabrana*, Schiff.

Synonymy.—Schiff., S. V. p. 130 (1776); Fab., Mant. ii, p. 234 (1787) (*elevana*), Hüb., Tort. fig. 169 (1797); Id., Verz. p. 383, No. 3706 (1826); Treitschke, Schmett. von Europa, viii, p. 255 (1830); Herrich-Schäffer, Syst. Bearbtg. der Schmett. von Europa, iii, pl. 2, fig. 11, and p. 149 (1847); Heinemann, Schmett. Deutsch. i, p. 14 (1865); Staudinger, Cat. Lep. Eur. ii, No. 652² (1871); Snellen, Vlind. Ned. Micr. p. 177 (1882); Sorhagen, Klein, Schmett. Brand. p. 64, (1886); Meyrick, Gen. Ins., fasc. 149, p. 64, 1913.

Original description.—*Tortrices cinereae* grauer. W. mit düstern höckern des rückenwinkels (Schiffermuller, *l.c.*). W. of course means Wickler ("spinner"), alluding to the larval habit of spinning together the leaves of the food-plant. The translation reads: *Tortrices cinereous*, light grey spinner: with dark raised spots on the base of the wings.

A great deal of confusion has arisen with respect to this name, Hübner having figured two extremely distinct forms, and both of them he called *scabrana*. His fig. 169 is the true *scabrana* of Schiffermuller; the other figure, fig. 58, he obviously discovered was different, and he subsequently renamed it, in his Verzeichniss, *veterana*.

It is, I think, necessary in view of Schiffermuller's very short description to give a few more particulars from Hübner's fig. 169. In this the base of the superiors is very dark brown or fuscous, there is the usual pale fascia next it, and the remaining portions are reddish light grey, slightly shaded with darker grey on the costal margin, and containing a number of dark spots and short lines.

Scabrana is a rare form in Britain, and is apparently restricted to the southern portion of the island. I have only succeeded at present in accumulating seven examples. Three of these were bred from Wicken larvae, and the other four are from the Bond Collection and are labelled Wimbledon.

(16) ab. **subscabrana** n. ab.

This form has a dark brown base similar to the last, but the remaining portions of the superiors are dark testaceous brown in colour, of a somewhat lighter tint than the base.

I have one example of this form—the type—from Kent; but it is more abundant in the north, at Lochinver, and in the Island of Soyea, off the Sutherlandshire coast, from which localities I have several specimens.

(To be continued.)

TWO NEW LYCAENID SUBSPECIES FROM THE LEBANON.

BY P. P. GRAVES, F.E.S.

Two subspecies of the two Near-Eastern Lycaenids, *Polyommatus candalus* and *P. isaurica*, were taken by me in the last days of August, 1910, in the highest part of Mount Lebanon on the plateau a short distance below the summit of Mt. Dhahr-el-Khodib (*Anglicé*, "The Star's Back"), i. e. at a height of fully 9000 feet above sea-level, and occurred above the plateau probably up to or nearly up to the summit, which is a little over 10,000 feet above sea-level. Specimens sent to Dr. Chapman for examination were reported by him to be respectively *candalus* and *isaurica*, but I had not the time then to describe these forms, which were obviously very different from the typical *candalus* and *isaurica*, and which, I must confess, I found it hard to believe really belonged to these species.

It will be noted that *candalus*, which in its habitat in Asia Minor, where it is reported from Kedos, Yozgad, Amasia, and the Taurus region, bears a considerable superficial resemblance to *P. icarus*, produces in the High Lebanon a subspecies differing greatly superficially from the type, which was described from Asia Minor by Herrich-Schaeffer, and somewhat resembling *P. isaurica*, a form of which is associated with it in the highest parts of Mount Lebanon. On this account I have named it *isauricoides*. It occurs elsewhere at lower but still considerable elevations in the Lebanon. I have records from Husn Niha, 1 ♂ about 4500 feet at the end of May, 1905, and on the Jebel Zahalta, 1 ♂ just below the Zahalta Cedars at a height of about 6000 feet, on June 1 of the same year. I also took a very worn ♀ of this form above the Zahalta Cedars in mid-July, 1904. One specimen was taken by me at the Cedars of Lebanon, between 6000 and 6600 feet above sea-level in late August, 1910, but the butterfly only occurred frequently on the plateau. In flight its appearance is very greenish—considerably greener than *Polyommatus (Agriades) coridon*.

A fairly full description of the species follows later. Meantime I may note for the benefit of those who are interested in the group that it differs from *P. candalus candalus* by its larger size, by the greenish-grey upperside and paler grey underside of the male, and in that while the discal series of spots on the underside is more pronounced than in the type, the submarginal and marginal markings are obsolescent. This last character is to be found among other high mountain forms of Lycaenids, e. g. the form of *P. icarus* occurring on the same plateau as *isauricoides*, and the subspecies of *isaurica*, itself a mountain species, which I here call *dorsumstellae*, and which shows this character much more pronouncedly

than *isaurica* from the Karli Boghaz (circ. 6000 feet). The ♀ differs from Anatolian *candalus* in the larger and more extensive yellowish submarginal markings on the upperside and in the paler underside, which varies from that of the Anatolian form analogously with the Lebanon ♂.

In the British Museum Collection are ♂ specimens of *candalus* from Antioch, which appear to me to exhibit characters, *e. g.* greyer underside, tendency to obsolescence of the marginal and submarginal markings of the underside, and greener tone of the upperside, marking a transition between the Asia Minor race and that of the High Lebanon. But as these specimens are not in the best condition, and have been relaxed, which process often produces a greenish tinge in violet blues unless employed shortly after capture, I feel somewhat diffident about naming this form.

Dorsum-stellae appears to be smaller than the few specimens of *isaurica* from the Taurus which I have seen, is of a somewhat brighter and more greenish blue in the male, and is distinguished in both sexes by the absence or obsolescence of the usual Lycaenid (Plebeiid) ocellation on the underside, which is none too strongly developed in *isaurica isaurica*. It is more frequent on the "Star's Back" plateau, after which I name it, than *candalus isauricoides*. I saw a female oviposit on a clump of the thorny *Geranium* which occurs at high altitudes on the Lebanon, which interested Dr. Chapman, to whom I sent the ovum. He remarked in a letter to me that this appeared to confirm Tutt's belief that *isaurica* belonged to the group of "geranium feeders" including *P. medon*, *P. donzelii*, *P. eumedon*, and from my own unluckily incomplete observations, *P. anteros*. The only Leguminous (Papilionaceous) plant which I recognised on the plateau was *Vicia hirsuta*. This may be the food-plant of the local form of *P. candalus*.

Polyommatus candalus H.S. ***isauricoides*** nov. subsp.

♂, *Upperside, both wings*: Pale greenish grey with a marked greenish lustre, their bases rather metallic blue-green, cilia long and white. *Fore wing*: Termen broad, dark brown, with dark, shadowed, acuminate inter-neural projections inwards. Neuration outlined in black from termen inwards for about a quarter of the length. Cell closed by a small black linear spot. *Hind wing*: The blue-green basal suffusion extends down anal margin to one-fifth from the anal angle. Termen broad from costa but greatly decreasing in breadth from area 4 with small inter-neural acuminate projections, which are absent from areas 1 and 1b. Neuration less markedly outlined in black from termen inwards than on fore wing. *Underside, fore wing*: Pale grey with blue-green suffusion at base; all ocelli black, white ringed; 2-3 basal spots as in *P. icarus*, *eros* and *candalus*; spot at end of cell and discal series of usually six disposed as in *candalus*, but more conspicuous and larger. The submarginal series of dark grey linear

marks followed by a paler area and a series of faint grey spots is much fainter than in nymotypical *candalus* from Asia Minor, and there is no trace of the yellowish-orange outer edging to the linear marks such as regularly occurs in *candalus* from Asia Minor. *Hind wing*: Ground-colour a trifle warmer than on fore wing. Markings as in *candalus*, but the blue-green basal suffusion is far more extensive and the outer border of the discontinuous submarginate crenulated markings is of a much paler yellowish orange when fresh, and the white dash in area 3 between the 4th and 5th ocelli in the discal series is larger.

♂. *Upperside*: Differs from *candalus* in being of a lighter brown ground-colour, and having the bases of all wings slightly suffused with greenish-blue scales: by the presence of a diffuse pale-yellowish submarginal band of rather square and relatively large spots separated by the neuration extending from the anal angle to vein 6. On the *hind wing* there is a similar band of crescentic spots which reaches vein 7, and almost encloses circular dark-brown marginal spots based on the termen and doubled in space 1b. *Underside*: Generally resembles that of ♂ *candalus* from Kedos and Yozgad, but the ground-colour paler and more yellowish grey: the submarginal and marginal markings on all wings are less and the discal series of spots on the fore wing are more distinct than in the type.

Length of fore wing: ♂, 12.5 to 15 mm., average 14 mm.: ♀, 13 mm. to 13.5 mm.

♂ *genitalia*.—The harpes (valves) seem somewhat narrower than in the Asia Minor race. Otherwise I can detect no real difference, but have only had two preparations of the genitalia of *candalus candalus* before me.

Described from 8 ♂ and 3 ♀ in B.M. Coll. and my collection.

Locality.—Cedars of Lebanon 1 ♂ 6000–6600 feet and Cedar Mountains (Dhahr el Khodib Range of the N. Lebanon) 8000–10,000 feet, taken at the end of August, 1910, by P. P. Graves. The B. M. Coll. also contains single specimens from the following localities on the Lebanon, all taken by Mrs. Nicholl: Husn Niha (wrongly labelled Hassan Niha), Jebel Sannin 7000 feet, Ain Ata. Ain Ata is about 5000 feet above sea-level and lies on the E. slope of the Lebanon, as does Niha. There is also a ♀ taken at Afka in the N. Central Lebanon. All the above were taken in June, 1900, or in the case of the Niha ♂ in late May of that year.

Polyommatus isaurica dorsum-stellae, nov. subsp.

♂. *Upperside*: Of a brighter slightly more greenish and lustrous blue than *isaurica isaurica* from the Taurus. The dark termen on all wings narrower, the cilia pure white and showing traces of dark colour at their bases as they do on the fore wings of *isaurica isaurica*. *Fore wing*: The neuration not outlined in black from the termen inwards as on the fore wings of *isaurica isaurica*. *Hind wing*: The inter-neural acuminate projections smaller than in *isaurica* from the Taurus, and the large blackish projection, which is so noticeable in the B.M. Coll. specimens of the latter, is absent. *Underside*: Ground-

colour darker and greyer than in *isaurica isaurica*. A very marked absence or obsolescence of ocellation, the ocelli often being represented by white circular spots. The marginal and submarginal markings of all wings are equally ill-defined and indeed often disappear. *Hind wing*: The greenish suffusion at the base much more extensive than in *isaurica isaurica*. The white dash in area 3 longer and broader.

♀, *Upperside*: Dark rather lustrous brown with small dark spot closing cell of fore wing, cilia of all wings brown, termen narrow, on all wings faint blue-green scaling at bases, and traces of a submarginal series of spots in the form of reddish or yellowish-grey lightnings. *Underside*: Ground-colour clear yellowish-brown. The ocellation and submarginal marking of *isaurica isaurica* ♂ are better preserved in the ♀ than in the ♂ of *dorsum-stellae*. I have unfortunately no ♀ of *isaurica* from the Taurus to which to refer, but the Lebanon ♀ ♀s give the impression of a race which is fully a grade beyond *isaurica isaurica* ♂ in obsolescence of marking, while a grade less advanced than their own ♂ ♂s. The discal series on the fore wing and the submedian series on the hind wing of the ♀ underside have survived better than in the ♂ *dorsum-stellae*. The marginal and submarginal markings are more noticeable, but are by no means as well defined as in *isaurica isaurica* ♂.

Length of fore wing: ♂, 13-14 mm.; ♀, 12.5-13 mm.

♂ *genitalia*: I can detect no difference worth mentioning between *isaurica* and *is. dorsum-stellae*.

Described from 12 ♂ and 6 ♀ in the B.M. Coll. and my own collection.

Locality.—Except one ♂ from Ain Haour, Anti-Lebanon, taken early in June, 1900, at an altitude of 5900 feet, all the *dorsum-stellae* which I have studied were taken on the Dhahr el Khodib at the end of August, 1910.

The Ain Haour ♂ is a little nearer *isaurica* from the Taurus.

LEPIDOPTERA AT GUÉTHARY, BASSES PYRENEES.

BY G. H. GURNEY, F.Z.S.

ON my way to Spain last July, I broke the journey for a few days at Guéthary, a few miles beyond Biarritz, staying with Mr. R. Trappes-Lomax, who accompanied me, at the comfortable little Hotel Eskualduna, which is only a stone's throw from the railway station and within an easy walk of the best collecting-ground at Guéthary. A good deal of the surrounding country has been recently built over, and small holdings and market gardens have sprung up, consequently one's collecting is somewhat restricted, but the rough bracken and heather-covered hills a mile or two inland are still untouched, and here are to be found such interesting species as *Coenonympha oedipus* and *Cyclopides morphens*, to take which was the principal reason of my stopping at Guéthary.

Between the hills run small lateral valleys, the sides clothed with a thick growth of furze, alder scrub and heather, with occasional groups of pine trees from which a pair of buzzards every day surveyed our doings. Along the bottoms of these valleys run small streams, which in their course towards the sea spread out into little marshes and swamps and nicely wooded dells, filled with a luxuriant semi-aquatic vegetation of rushes, grass and patches of *Osmunda*. These swamps are well sheltered from the prevailing winds and most of the Lepidoptera of the neighbourhood are to be found therein. The miserable weather which prevailed over all Northern and Central Europe during last July was very much in evidence during our stay at Guéthary: incessant rain day after day at this date in this south-western corner of Europe was, we were told, almost unknown: when the sun did shine it was very hot, and the one unbroken day of sun we did have gave us a foretaste of the heat we were presently to have in Spain. As it was, owing to the bad weather insects did not appear as I had expected, and I had to stay several days longer at Guéthary than I had originally intended to do, but on the days when collecting was out of the question one was able to utilise the railway line and make charming excursions to some of the many interesting places in the neighbourhood. One day to Bayonne with its splendid Gothic Cathedral and curious covered-in streets, and another day to Fuenterrabia, a few miles into Spain, a most picturesque medieval town with a fine twelfth century Castle, up the walls of which was growing an immense *Bignonia radicans* covered with blossom. It was a lovely sight, and must have been from the size a very old specimen.

The old houses, too, of the ancient Spanish nobility, who have long ago left the place, were full of interest, with beautiful balconies and projecting carved roofs, and elaborate stone coats of arms of their former noble owners. So collecting when the sun shone and making excursions when it did otherwise, our few days at Guéthary were very agreeably spent, and were a preliminary to the more serious work later on in Spain.

The following is a list of the Lepidoptera I took and identified at Guéthary:

Pieris brassicae.—Common and fresh. Some of the females are large, but not remarkably so.

P. rapae.—Probably we were between the broods, as this species was distinctly scarce: the two or three specimens I saw and netted were much worn.

P. napi.—A good many with strongly marked undersides were seen round the marshy spots.

Leptosia sinapis.—Odd specimens occurred.

Colias croceus.—Was seen occasionally in rough fields by the coast. One or two of them may be called ab. *pallida*.

Gonepteryx rhamni.—Common and very fine, quite fresh; the females are very large.

Thecla ilicis.—This was the only member of the family we saw. They were not common, but odd examples occurred here and there; they were quite fresh.

Heodes phlaeas.—Widely spread; they showed little or no tendency to var. *Eleus*.

Lampides boeticus.—Just emerging on July 7th: we saw none previous to that date, but they quickly became common. Some of the females are very large and were generally taken haunting the furze bushes, which are no doubt their food-plant here.

Everes argiades.—Widely spread and very common. This species was to be taken equally plentifully either sitting on the long grasses in the hay-fields or on the dry banks amongst the heather. Many were much worn, but it was easy to get a long series of newly emerged specimens.

Plebeius argus (aegon).—The most plentiful butterfly round Guéthary; very abundant on all the heaths and rough ground. It is a fine large form, the undersides well spotted. They were quite fresh and I took a long series of beautiful specimens.

Polyommatus icarus.—Common, widely spread; the females with little or no blue on the upperside.

Celastrina argiolus.—A very beautiful form was common, the males of good size and richly coloured, the females with very large black tips to the fore wings. They were haunting the ivy which grows so plentifully in the lanes round Guéthary.

Limenitis camilla.—A single fresh male was captured by Mr. Lomax; this was the only one seen.

Vanessa io.—Not common.

Pyrameis atalanta.—One specimen seen.

P. cardui.—Only two or three seen.

Melitaea dictynna.—Both sexes were common in the small marshes and fresh. A well-marked richly coloured form.

Argynnis dia.—The second brood of this insect was evidently just out from their condition. They occurred frequently amongst the bracken and heather on the hillsides.

Melanargia galathea.—Very common. Not a darkly marked form, and can hardly be described as var. *procida*.

Satyrus alcyone.—Just emerging when we left on July 13th, and no doubt would soon have become common.

Hipparchia arethusa, var. *dentata*.—The males were not scarce, the females not yet out. Like the preceding species we were a few days too early for it.

Enodia dryas.—A splendid form of this butterfly occurs at Guéthary, and the few males taken were very fine and large. It lived on the rough hillsides of the valleys, flying alongside them, and

was never observed to go down into the marshy swamps at the bottom. A week later the species would probably have been plentiful.

Pararge megera.—Widely distributed, but not common.

P. egeria.—A fine richly coloured tawny form was common, and quite fresh, the females especially being in lovely order.

Aphantopus hyperanthus.—Abundant everywhere.

Epinephile jurtina.—Abundant everywhere, with large females; many of them might be called var. *hispulla*.

E. tithonus.—Exceedingly common; the form is a very dark one. In the males the base of the fore wings is much suffused with dark brown, and the light band on the hind wings almost obsolescent. I have one male in which the orange is almost non-existent, at a distance giving the appearance of an entirely dark brown butterfly.

Coenonympha oedipus.—This rare and local species was one of the reasons which detained me at Guéthary longer than I had intended. It was not out when we arrived, and the bad weather which then set in hindered its emergence. I delayed as long as I could hoping the weather would improve, and finally had to leave Guéthary with a modest series of six specimens, including two females, all of course in faultless condition. All these were taken in one very restricted portion of a small swamp. It has a weak, rather feeble flight, and was more often walked up from the rushy ground than netted on the wing.

C. pamphilus.—Pretty common all over the region, and in no way calling for any special remark.

C. arcania.—A nicely marked form with conspicuous white bands on the underside was abundant and generally very fresh.

Carcharodus alceae.—A single fresh male was taken—the only one seen.

Hesperia malvoides.—Three or four specimens of what I consider to be this species were taken on July 11th in a corner of a flowery meadow. I saw it nowhere else.

Thanaos tages.—Not common.

Thymelicus actaeon.—Several taken, but they were a good deal worn.

Augiades sylvanus.—Very common and quite fresh.

Cyclopides morpheus.—This curious butterfly was common and in beautiful condition, and I took a fine series of both sexes. Its headquarters were undoubtedly in and adjoining the small swamps, but it was much less local than I had expected to find it, and many were taken in entirely different surroundings, *i. e.* on the dry hill-sides amongst the heather, in the fields of standing hay, and often amongst thick undergrowth in the small woods towards Biarritz. A small colony was found in a very hot sand-pit, where there was very little vegetation of any sort beyond some dried-up grass and

flowers. Their flight is very characteristic—the true Hesperid hovering motion reminding one very much of *H. sidae* in its peculiar action. I saw one hovering over a flower for several seconds before settling on it, almost like a moth. On the sheltered side of a hill in a very hot corner they would settle on the bracken leaves amongst crowds of *P. argus*, and if disturbed would fly gently off, in a series of jerks, soon resting again on another frond, unless they met another individual of their own species, when the two would go careering up the hillside together at a great pace, one invariably returning to its original perch again before long.

In my series there are a few minor variations in the size and number of the spots on the upperside of the fore wings, but they are curiously constant as a whole. When quite fresh the spots on the underside of the hind wings are of a rich orange colour; this quickly wears off and the spots become pale yellow or almost white.

This concludes the somewhat meagre list of insects I met with at Guéthary. I hope to write an account of my subsequent doings in Spain at an early date.

Keswick Hall,
Norwich.

NOTES AND OBSERVATIONS.

A NOTE ON *ARICIA MEDON*.—Inadvertently we omitted in our article on the variation of this to mention that we have in our possession a specimen of this insect in which the left fore wing displays on the underside a transition to the condition of *ab. cuneata*. None of the other wings are affected and above the insect is of the *semiallous* form.

We do not wish to enter into any controversy with Mr. Wheeler on the question of the misuse of the name *salmacis* for we are quite content to leave the facts to the judgment of your readers. However, we do point out that Mr. Wheeler does not dispute the grotesqueness of the nomenclature, and, secondly, that neither of us has ever admitted its necessity; on the contrary we have always protested against it.—WILLIAM CARTER and J. W. HESLOP HARRISON; Hancock Museum, Newcastle-on-Tyne.

UTETHEISA (DEIOPEIA) PULCHELLA IN KENT.—I took a specimen of *Deiopeia pulchella* in some fields above Tonbridge on May 5th, 1923.—D. SPENCE; Park House, Tonbridge.

YELLOW ABERRATION OF *HIPOCRITA JACOBÆÆ*.—From one of a number of caterpillars collected near Norwich last summer, a female Cinnabar moth (*Hipocrita jacobææ*) has resulted in which the streak and spots of the fore wings are of a dirty yellow colour, though on the right side a small bit of the innermost part of the streak is of the usual crimson colour.* The hind wings are of the usual colour but both have in them some yellow scales. This specimen would appear to be somewhat similar to that recorded from Hants, mentioned in

* A similar specimen was taken last year in Jersey, Channel Islands.—ED.

South's *Moths of the British Isles*.—E. M. TOWN-JONES; Brundall, North Grange Road, Headingley, Leeds, May 29th, 1923.

PERONEA HASTIANA: A PROTEST.—I venture to enter a mild corrective protest against the ingenious train of curious mathematical fallacies by which (on p. 128) Mr. Sheldon, with the approval of Mr. Durrant, endeavours to prove that a trapezium is a triangle. I apprehend his argument to be that trapezium = quadrangle = semi-quadrangle = triangle, all three steps being fallacious, and the second apparently a particular case of an assumed axiom that things which are halves of the same thing are also halves of one another, which is not found in Euclid. The German trapezförmigen means trapezoidal. I have used that term in print some thousands of times, and am discouraged to find that Mr. Durrant may have been interpreting it all through as triangular. A quadrangle is equivalent to a rectangle, and has all its angles right angles. Euclid, after defining this and other regular quadrilaterals, says, "any other four-sided figure is called a trapezium." A common form of costal blotch in the genus *Peronea* is trapezoidal, being four-sided with upper (costal) and lower (discal) sides nearly parallel, and lateral sides converging downwards. I entertain no doubt that this is what Wocke intended. Moreover it does not seem to have occurred to either interpreter that if Wocke meant triangular there was nothing to prevent his saying so. I remember my friend the late Lord Walsingham, when some critic had remarked on a statement of his that "no doubt Lord Walsingham meant to say so-and-so," replying with just indignation, "If I had meant to say so-and-so I should not have taken pains to state the exact opposite."—EDWARD MEYRICK; Thornhanger, Marlborough, June 3rd, 1923.

AN ALIEN MOTH AT MANSFIELD.—I was both interested and pleased to see in the May number of the *Entomologist* an account and description of a moth by Mr. F. J. Stubbs, which had been taken in a banana warehouse in Manchester. I have a specimen in my collection which exactly fits in with the description in the *Entomologist*, and is no doubt the same species. I have not been able to find its name, but after seeing the note in the *Entomologist* (lvi, p. 113) I feel sure it must be either *Ceramidia butleri*, Möschler, or *C. viridis*, Druce. It was taken by a friend of mine who is in charge of the ripening rooms, which are heated to various temperatures, at Kirkham's banana warehouse at Mansfield. The bananas came from Costa Rica. He took the moth on October 20th, 1916, and as he just put a pin through it and left it in the hot room for some days of course it was dead and dry when I received it. He was not used to handling Lepidoptera, so he had knocked off part of the antennae, but otherwise it is in good condition.—WILLIAM DAWS; 39, Wood Street, Mansfield, Notts.

The specimen taken in a banana warehouse at Mansfield, and now in the collection of Mr. W. Daws, is *Ceramidia viridis*, Druce. We have only one specimen in the British Museum collection, Druce's holotype ♂, which came from the Chiriqui volcano, Panama. The specimen taken in Manchester, recorded by Mr. Stubbs, is a distinct species, and one I have been unable to identify. There is in the British Museum collection a drawing of a specimen taken in

Marlborough High Street. This drawing bears no information as to the present location of the specimen, and I have found no record of it. The drawing agrees so well with the Manchester specimen that I think the Marlborough and Manchester specimens represent the same species. I should like to hear from the present owner of the Marlborough specimen, so that I can label the drawing in the British Museum collection properly; and I should be glad to have the opportunity of examining the specimen.—W. H. T. TAMS.]

ANOTHER MACROPTEROUS METRIOPTERA ROËSELII, HAG.—In the March number of this magazine (vol. lvi, p. 65) I recorded the capture of a macropterous *Metrioptera roëselii*, Hag., in the Chamonix Valley. On looking through some of the grasshoppers that I have not yet had the opportunity to set, I found a female of the same variety. It measures 26 mm. from the front of the head to the tip of the ovipositor, and 40 mm. from tip to tip of the extended elytra. This insect was taken on the same day and in exactly the same locality as the previously recorded male. Any entomologist visiting the district this summer would do well to look for more of this hitherto rare variety.—T. F. HEWER; 24, West Shrubbery, Redland, Bristol.

NEW FOREST NOTES, 1922.—Despite the wet summer it has been a good season for many insects in the New Forest district. The following records apply almost wholly to the Hymenoptera Aculeata, but in view of the unusual weather conditions prevailing from June onwards a few notes also on the more popular **Lepidoptera** may be of interest. Forest butterflies seemed almost up to the *pre*-1920 numbers, but exceptionally invariable, *Argynnis cydippe* producing the only aberrations of note. Although bathed in an almost continual drizzle *Limenitis sibylla* was emerging freely at beginning of July, and could be found in its special haunts, drying its wings (in a double sense) on the bracken in scores. Fortunately the rain was not of the heavy type that almost denuded the woods of insect life in 1920, and those collectors hardy enough to brave the tenacious mud and dripping foliage of the enclosure drives found the three large fritillaries plentiful enough, albeit so much later than normal, that August was well on before they showed much sign of wear and tear. Fresh *sibylla* were also quite easy to obtain in August (a most unusual event), during which month I took an intermediate ab. *nigrina* of the ♂ and know of another seen.

Dryas paphia var. *valezina* was another butterfly not at its best until the holiday month, towards the end of which *Catocala sponsa* turned up in something like its old numbers at Hurst Hill.

A feature of June was the extraordinary quantity of moths at sugar, the inclusion of several *Triphaena subsequa* making it seem quite like "old times"—although I must say that previously to this year I had never seen it in the forest at all! The same personal experience applied to *Eurois prasina* (*herbida*), which for once really could be seen by the dozen, even if almost obliterated at times by vast hordes of *Aplecta nebulosa* in every conceivable shade of grey.

I give here a list of the more interesting **Hymenoptera Aculeata** taken by me in 1922. As in the case of all orders of insects the

weather was a severe drawback to collecting, but the Aculeates have the great advantage of possessing some sort of settled home to resort to, so that even an hour or two's sunshine is sufficient to make them active, whilst less fortunate insects like the Diptera soon succumb to unsettled conditions.

Ants: *Tapinoma erraticum*, Latr.—Gravel pits at Setley in September. *Ponera contracta*, Latr.—By Bucksford enclosure. *Myrmica rubra*, L.; race *Scabrinodis* perhaps the most abundant, but two other forms often found with them. Shares with *Formica rufa*, L. the distinction (?) of being the commonest forest ant, or, at least, the most in evidence!

Fossorial: *Mutilla europaea*, L.—Not so common as last year, but several females taken, and the beautiful ♂ at Rhinefield on bracken. *M. rufipes*, Latr.—Females on Barton beach in September, within a few yards of the sea. Apparently a maritime species here! (*Methoca ichneumonides*, Latr.—Taken by Mr. Lucas this autumn.)

Pompilus bicolor, Lep., *P. spissus*, Schiödt, *P. gibbus*, Fab., *Salix pusillus*, Schiödt, and *S. parvulus*, Dahlb., all common in gravel pits, or banks, by woods.

More generally distributed are *P. niger*, Fab., *P. viaticus*, L., *S. fuscus*, L., and *S. exaltatus*, Fab.

Ceropales maculata, Latr.—Wood Fidley, by the railway. *Astutus boops*, Schr.—Setley, but rare. *Tachytes perlinipes*, L.—Setley, not uncommon, varying greatly in size.

All *Ammophila*, Kirb., except *lutaria*, Fab. *A. campestris*, Latr., and *Ps. hirsuta*, Scop., more local than *A. sabulosa*, L. I watched a ♀ of the latter species endeavouring to drag a caterpillar of the "Pebble prominent" moth into its burrow. It first of all tried to walk in head first, clutching its burden by the claspers, with the ventral side uppermost spread out along the wasp's body, which is the usual method adopted by the caterpillar-hunting fossorial in carrying their prey. Finding this impossible owing to the vertical position of the tunnel, the resourceful insect at once dropped its victim, seizing it this time by the front of the head and walking thus backward with it into the burrow. Unfortunately, this only resulted in the caterpillar's head getting thoroughly jammed in the entrance, so out shot the wasp, now in a great flurry, and, after endeavouring to enlarge the hole by prising off pieces of earth by means of its powerful jaws, reverted to its former seizure—with no more success than before! By this time words were flying—luckily in wasp language—judging by the shrill buzzing that ensued, but happily by now for both our peace of minds, she at last effected her object by obtaining a higher hold on the head of the caterpillar. Previously by being held too low, and consequently twisted to one side, her most strenuous pulling had only resulted in a thorough bruising of the head of the unfortunate—but mercifully unconscious—prey. After watching the wonderful creature proceed to fill up the mouth of her burrow with pellets of earth mostly bitten off from the surrounding hard bank, and thus carefully obliterate all trace of her labour, I left her to a well-deserved rest and toilet. Note, that had the burrow only been a little less vertical in the first instance and the wasp's hold on the head of its prey a little higher in the second, she would have had little or no difficulty in attaining her object. In

every case I have watched of the burrowing wasps at work, each has had to learn by experience.

Diodontus minutus, Fab., and *D. tristis*, V. de L., both common. *Mimesa bicolor*, Fab.—Hollands Wood, etc. *Corytes mystaceus*, L., and (G.) *Hoplisus laticinctus*, Lep. (Royden). No *H. 4-fasciatus*, Fab., or *Nysson*, Latr., seen. *Cerceris ornata*, Schaeff. (not common). *C. arenaria* (Hollands Wood, burrowing in ground), *C. interrupta*, Panz., and *C. labiata*, Fab., *Oxybelus uniglumis*, L.—Chiefly railway banks.

Crabro: Most species common—*C. cephalotes*, Panz., strange to say, only at Barton-on-Sea. *C. vagabundus*, Panz. (Wood Fidley), *C. interruptus*, Pz. (Lymington, Boldre, etc.), and *C. lituratus*, Pz. the latter, very common, especially the males on *Umbelliferae*. *Vespa crabro*, L., rather scarce this autumn. *V. sylvestris*, Scop., uncommon, and *V. norvegica*, Fab., only at Royden. *Odynerus*, Latr.—An imposing number of species which I give in full: *O. spinipes*, L., *O. reniformis*, Gmel. (Royden in June), *O. callosus*, Thoms., *O. parietum* (not common), *O. pictus*, Curt., *O. trimarginatus*, Zett. (Lymington), *O. trifasciatus*, Oliv. (very local), *O. parietinus*, L., *O. antilope*, Pz. (rather common at Lymington), *O. crassicornis*, Pz. (Wood Fidley), *O. gracilis*, Brullé (Royden), and *O. sinuatus*, Fab. *Eumenes coarctata*, Latr.—Rather common at Setley in September.

A few bees need recording. Two *Prosopis* found: *P. communis*, Nyl., and *P. hyalinata*, Smith. *Andrena humilis*, Imhoff., I find only at Set Thorns enclosure, nesting on hard paths by the wood with its "cuckoo," *Nomada ferruginata*, Kirby. The fine *A. pilipes*, Fab., at Setley and Milford-on-Sea, nesting next door to the commoner *A. thoracia*, Fab. *Panurgus calcaratus*, Scop.—Barton-on-Sea in September. All the commoner and most of the local *Nomada*, Fab. *N. roberjeotiana*, Panz., often at Setley and probably not uncommon amongst the thousands of *N. solidaginis*, Panz., there. *Epeolus rufipes*, Thoms. (Setley).

Chelostoma florissome, L.—Common on old stumps; Brockenhurst, etc. *Megachile maritima*, Kirby, at Milford-on-Sea, and *M. ligneseca*, Kirby (very common; a large colony frequents the old maple stump by Boldre Church). *Osmia*, Panz. Only *O. rufa*, L., *O. pilicornis*, Smith, and *O. fulviventris*, Panz. *Stelis aterrima*, Panz.—Lymington. *Anthophora retusa*, L., very abundant, and *A. furcata*, Pz., at Royden. *Suropoda bi-maculata*, Pz.—All heaths and enclosure banks.

Diptera: Beyond a good series of ♂ *Tabanidae* taken during spring heat (including ♂ of *Atylotus fulvus*, Meig.) weather allowed of little collecting. Both sexes of *Tabanus bovinus* failed to appear! *Oncodes gibbosus* by "sweeping" at Perry Wood and *Callicera aenea* in August at Royden.—HUGH P. JONES; "The Briars," Brockenhurst, Hants.

HEAD TRANSPLANTATION IN INSECTS.—I notice you give a copy of Finkler's summary of his transplantation work.* It will be of interest to you to know that I performed similar experiments last September and October with *Bacillus rossii*, a second species of stick insect. This species is dimorphic, possessing a red and a green form. Several pairs of both types were decapitated and their heads trans-

* *Ent.*, lvi, p. 143.

posed. The operation seemed perfectly successful, but even after everything was healed up the insects walked backward!—J. W. HESLOP HARRISON; Armstrong College, Newcastle-upon-Tyne.

MELANISM IN LEPIDOPTERA. —Dr. Butler's reply to my note in the May number of the *Entomologist* indicates, I think, that he regards any black moth or butterfly as a case of melanism. This is not so, and the illustrations he gives are merely cases of melanic specimens. That Lepidoptera always have thrown off odd specimens of different colour to the type forms, not only black, but equally so in bright colours, we all know, but such instances are merely casual aberrations, and such black specimens have nothing to do with melanism as understood by lepidopterists, except in those recent cases where they have been the immediate forerunners of the formation of black or nearly black races. The word melanism of course implies that a black specimen must necessarily be melanic, but in these casual black aberrations, the word melanic is merely a substitute for the word black. The most uniformly black macro-lepidopteron we have in Britain is *Tanagra atrata*, but no one would think of associating *T. atrata* with melanism. Melanism in Lepidoptera means the gradual (or it may be sudden in some cases) increase of black colouring in species which were formerly pale, and of which in most cases no dark specimen had ever been seen, to such an extent that now the races of those species in the areas in which melanism occurs have become quite black, or nearly black, to the more or less complete elimination of the original forms. It was with no small astonishment that I read Dr. Butler's question, "Who told Mr. Porritt that melanism is a very recent phenomenon?" because the fact has been accepted by practically every British lepidopterist for forty or more years. The simple answer is, that palpable obvious *facts* have told me, as they have also told every lepidopterist who has had a lengthened experience in field work in the areas where melanism is strongest, *i.e.* in West Yorkshire and some parts of Lancashire. When, during my more than sixty years' experience as a lepidopterist, I have seen species after species—in the aggregate a large number—which in my early days were universally pale in colour, but in which now the black or almost black specimens immensely preponderate; and when at the present time I see, as I do, other species which are also becoming black, surely the evidence is sufficient for anyone. And can anyone doubt that all these species under present existing conditions will always remain dark? Dr. Butler is singularly unfortunate in his illustration of the pure white wild primrose. If it were a parallel case to melanism, the white flowers *ought* to increase year by year, to the ultimate exclusion of the ordinary yellow flowers, but that is exactly what they are *not* doing.

I am not a geologist, but as an outsider it seems to me that if "*Palaeontina oolitica*," apparently the most ancient fossil Lepidoptera, shows by its neuration a relationship to *Dasyophthalma*, and in Dr. Butler's other illustrations the allied modern forms still retain the same character of colouring as their fossil representatives possess, the inference is that they always have been of the same colours. But would not the long process of fossilisation completely destroy any bright colour that may have existed, and leave only a dark shadow, representing the original colour matter, on the fossil? Why Dr.

Butler has now introduced into the discussion the question of protective resemblance I do not know, as we all admit its operation; but to say that bright colours have been developed in the male to render him more attractive to the female is open to question, as every field lepidopterist knows that female Lepidoptera almost invariably accept the first male that comes along, even if his wings are tattered to shreds; and on the other hand, if a hopelessly crippled female happens to be alongside one in the most perfect condition, the male is quite as likely to select the cripple as the other. Further, lepidopterists will bear me out in saying that a moist warm season does not produce more melanistic specimens, and that a cold dry season does not produce more albinistic examples. If there is any difference it is *vice versa*, and, although I am not at all sure about it myself, most of the collectors here count on a cold sunless summer to produce more than the usual number of melanic specimens. Finally I did *not* assert that "the conditions of life are pretty much the same as they have been for thousands of years," but that so far as we know it is so. My authority is ordinary common sense, but I may add that among many similar evidences, the discoveries recently made by the late Lord Carnarvon in Egypt show that it was so at least three thousand years ago.—Geo. T. PORRITT; Elm Lea, Dalton, Huddersfield, June 11th, 1923.

HIBERNATION OF PYRAMEIS ATALANTA.—With reference to Mr. Wm. Christy's note in *Entomologist*, p. 114, respecting the hibernation of *P. atalanta*, he states: "We have no proof that it does hibernate here." It may interest him to know that in the *Entomologist*, vol. xlvi, I published a detailed account of three specimens having been found hibernating in a natural state at Orpington, Kent. The first was discovered in February, 1907, while during the following year Capt. E. B. Purefoy had under his observation several specimens of this butterfly which successfully hibernated in his butterfly garden in Kent. This species regularly migrates to this country; the usual time of its arrival is during the latter half of May.—F. W. FROHAWK.

RECENT LITERATURE.

A Naturalist in Hindustan. By Major R. W. G. HINGSTON. 288 pp., 10 pls., and numerous text-figures. H. F. & G. Witherby. Price 16s.

MAJOR HINGSTON has followed up his book entitled *A Naturalist in Himalaya* with a volume called *A Naturalist in Hindustan*.

The book deals with the habits of certain humble forms of life, *e. g.* ants, spiders and beetles, to be found in the neighbourhood of an Indian plains station. It comprises ten plates, a few text-figures, and 288 pages of letterpress with a short index.

Chapter I contains a description of the district, viz. the "Manjha," which is an old bed of the Gogra river near Fyzabad—just a flat expanse of sand, supporting a low jungle of tamarisk and scrub.

The next three chapters are concerned with the habits of the Indian black ant (*Camponotus compressus*). The fornicaries are described, the various castes, *e. g.* soldiers, workers and sexual forms, and the relations between the ants and their "cattle," *i. e.* coccids of

various kinds, whence they obtain the excreted juices. But the main interest lies in the observations and experiments that Major Hingston has made with a view to elucidating the instincts of the black ant as compared with other species of the ant tribe. Patient study has revealed that the black ant has a wonderful sense of direction and a memory for places, which is even more useful to it than its sense of scent.

Chapter V is entitled, "The Evolution of Instinct." Three species of ants belonging to the genus *Camponotus* are compared, viz. the Black Ant (*compressus*), the Ashy *Camponotus* (*paria*) and the Silky *Camponotus* (*sericeus*), and an attempt is made to show how the instinct of communication has been evolved. The particular feature observed by Major Hingston was the method of summoning a party to render assistance. The Silky *Camponotus* is the most primitive: a single assistant is usually summoned and he follows his leader by touch only, since the slightest disconnection severs the pair. The Ashy *Camponotus* also only summons a single assistant, but communication is maintained by scent. The Black Ant summons a whole troop, who follow their leader by scent. The final step is furnished by the *Phidole* ant, who communicates the news to the fornicary, when a whole herd follow by scent the track taken by the discoverer to the nest.

Chapters VI and VII deal with an ant of a different species, viz. *Polyrachis simplex*, and describe the methods whereby it builds byres to protect and imprison coccid "cattle."

Chapters VIII to XI describe the cocoon chambers and snares of certain spiders. These are, perhaps, the most interesting chapters in the book. Major Hingston has taken an infinite amount of pains to ascertain how the dome-building spider (*Cystophora citricola*) constructs its peculiar snare, and how another spider (*Stegodyphus pacificus*) uses a flail to construct a conical tunnel, which expands into a viscid sheet.

Chapters XII to XIV describe the activities of the dung-burying beetles, and contain a number of observations made with a view to ascertaining the limitations of the particular instincts employed.

The final chapter describes the advance of the south-west monsoon, and the marvellous change it effects in the dried-up plains of India.

The book is written in a simple style and cannot fail to be of interest to readers of all classes. It is not merely a record of observations, but the results of numerous experiments. It is only by immense patience that useful results can be obtained. Patient observers of the right type are few and far between, but there is no doubt that Major Hingston stands in a class by himself; not only does he know what to observe and how to do it, but he also is able to draw important and seemingly correct deductions, and lastly, but by no means leastly, to write a most interesting story which never palls for a moment.

W. H. E.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 2nd, 1923.*—Mr. E. E. Green, President, in the Chair.—*Election of*

Fellows: The following were elected Fellows of the Society: Dr. R. C. Lowther, M.B., Ch.B., Fernleigh, Grange-over-Sands, Lancs; Mr. John D. Sherman, Junr., 132, Primrose Avenue, Mount Vernon, New York, U.S.A.—*Wicken Fen Fund*: The Treasurer made a statement on the financial position of the Wicken Fen Fund and made an appeal to Fellows for further contributions.—*Exhibitions*: Mr. W. G. Sheldon exhibited types of *Argynnis aglaia scotica*, Watkins (Ent., vol. lvi, p. 109).—Professor E. B. Poulton, F.R.S., read notes on (1) The meal made by a monkey on Lepidopterous larvæ and pupæ; (2) Some striking examples of mimicry in butterflies from the Federated Malay States.—Mr. W. J. Kaye exhibited some Nymphaline butterflies that showed the upper surface pattern as seen from beneath in a floating flight. Professor Poulton, in discussing Mr. Kaye's exhibit, read a letter from Lord Rayleigh, F.R.S., on the optical interpretation of this phenomenon.—Mr. C. L. Withycombe exhibited and gave some account of an Ascalaphid larva from Nyasaland.—Mr. T. W. Kirkpatrick exhibited living larvæ of *Pterocroce storeyi*, Withycombe, from near Cairo, and distributed several to Fellows desirous of breeding them.—Mr. O. E. Hanson exhibited examples of *Leistus montanus*, Steph., from the Knockmealdown Mts., Co. Waterford.—*Papers*: The following papers were read: (1) "On the Classification of the Carabidæ," by Mr. T. G. Sloane. (2) "Observations on the Growth of the Larva of the Puss Moth (*Dicranura vinula*, Fab.)," by Mr. G. B. Walsh, B.Sc. (communicated by Mr. E. C. Bedwell). (3) "On *Thysanura*, Termitidæ, and Embiidæ, collected in Mesopotamia and N.W. Persia by Mr. W. Edgar Evans, B.Sc., and Dr. P. A. Buxton," by F. Silvestri (communicated by Mr. K. J. Morton). (4) "On the Larva of *Pterocroce storeyi*, Withycombe (Nemopteridæ)," by Dr. H. Eltringham. (5) "Systematic Notes on the Crocini (Nemopteridæ), with Descriptions of New Genera and Species," by Mr. C. L. Withycombe, M.Sc. (6) "On the Mallophaga of the Shackleton-Rowatt Expedition, 1921-1922," by Dr. J. Waterston.

Wednesday, June 6th, 1923.—The Rt. Hon. Lord Rothschild, F.R.S., etc., Vice-President, in the Chair.—*Obituary*: The Chairman announced the death of Canon W. W. Fowler, a past President of the Society, and a votè of condolence with his relatives was passed.—*Exhibitions*: Mr. J. F. Green exhibited and made remarks on Butterflies from the South of France.—Mr. H. Mace exhibited Butterflies from the neighbourhood of Khartoum, and said that there is evidence of species being recently introduced there from further up the Nile.—Dr. G. D. Hale Carpenter made remarks on *Pseudacraea eurytus* and its models in Eastern Uganda, and showed specimens and lantern-slides in illustration of them.—Mr. C. B. Williams exhibited Nemopterous larvæ from Egypt and some photographs of the type of country in which they are found. He also exhibited photographs of native bee-hives, and of an incubator for testing the effect of different temperatures on insects.—Professor E. B. Poulton, F.R.S., exhibited a remarkable male of *Papilio dardanus*, Brown, and showed a number of lantern-slides illustrating the occurrence of reciprocal mimicry between three indigenous Fijian Euploeine Butterflies and an invading *Euploea*.—S. A. NEAVE, *Hon. Sec.*

OBITUARY.

IN the Rev. Canon William Weekes Fowler, who died on June 3rd at the age of 74, Entomology has lost one whose name must for long be one of the most familiar to all who study the Coleoptera of these islands. Although in the course of a full and active life he played many useful parts, it is as the author of the Coleoptera of the British Islands that he will be chiefly known to fame.

Son of the Rev. Hugh Fowler, Vicar of Barnwood, Gloucestershire, he was born in January, 1849, educated at Rugby and became a Scholar of Jesus College, Oxford. He was ordained in 1873, on his appointment as a master at Repton School, and seven years later became Headmaster of Lincoln School, a post which he held for more than twenty years. He relinquished it to become Rector of Rotherfield Peppard, Oxfordshire, in 1901, and in 1904 went as Vicar to Earley, near Reading, where he was preparing to officiate at the Sunday morning service at the time of his sudden death. Amongst numerous other offices held by him at different periods, he was Canon of Lincoln Cathedral, President of the Headmasters' Association (1907), Secretary of the Entomological Society (1886-1896), President of the Entomological Society (1901-02), Vice-President of the Linnean Society (1906-07), Member of the Scientific Committee of the Royal Horticultural Society, and Member of the Reading Guardians.

In addition to the Coleoptera of the British Islands, published in five volumes between 1886 and 1890, to which, in collaboration with Mr. H. St-J. Donisthorpe, he added a supplementary volume in 1913, he was also the author of a volume contributed to the series issued by the Indian Government on the Fauna of British India, containing a General Introduction to the Families of Coleoptera found within the Indian Empire and a complete enumeration of the Cicindelidae (or Tiger-beetles) and Paussidae.

Another important work, which occupied him between 1894 and 1909, formed part of the *Biologia Centrali-Americana* of Godman and Salvin. For this great undertaking he dealt with all the Homopterous insects except the Cicadidae, Fulgoridae, Coccidae and Aleurodidae. His contribution to Wytzman's *Genera Insectorum*, on the Family Languriidae, and various other papers on the same group of beetles, are rather fragmentary and of little importance.

In his small and apparently delicate frame Fowler held a great store of vitality and an apparently inexhaustible appetite for hard work, notwithstanding which he was by no means a hard taskmaster to those under him, and by his invariably cheerful and amiable disposition never failed to win popularity and esteem from his pupils and associates of every kind. Although possessed of little critical power or gift for origination, he had a taste for the not usually attractive labour of collating and tabulating the records of others' results and a readiness to undertake toil from which other men turned away which led him sometimes into fields for which his qualifications were not apparent. Entomology has reason for gratitude to him for much useful spadework, and, to all who study British Beetles, his principal achievement, the Coleoptera of the British Islands, is the indispensable starting-point for any fresh advance, and is not likely soon to be superseded.

G. J. A.

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ON SOME PALEARCTIC SATURNIDS (LEP., HET.) FROM SZECHUEN, WESTERN CHINA.

By J. HENRY WATSON.

Antherea francki sp. nov.

ALLIED to the *roylei-pernyi* section of this multiple genus; nearer to the former than the latter species in general resemblance. Antennae pale brown, lighter than either of the above named. General colour of the wings not so roseate as *pernyi*, and about intermediate between average specimens of *roylei* and *pernyi*. Fore wing: more falcate than *pernyi* and average specimens of *roylei*, and edged with brown and not yellow. The ocellus larger than *roylei*; not so large as *pernyi*, the vitreous area likewise. The submarginal brown line more excised than the two mentioned species, having at the middle a continuous fainter line within (not often found in *roylei*).

Hind wing: markings faint, and with a very faint line from anal edge of ocellus to edge of wing, which appears to fork, the upper branch terminating opposite end of the abdomen, and the lower ending near the faint submarginal line. No band between ocellus and base of wings. Below, darker and browner than *roylei* or *pernyi* and with subdued markings; the submarginal ones not edged with white or grey.

Length of fore wing 75 mm.

Type: ♂ in collection J. Henry Watson.

Hab.: Szechuen, Western China. Taken at Kwanhsien 20/7/1920 by Rev. G. M. Franck.

A. chengtswana sp. nov.

Near *A. assamensis* Helf.; wings more attenuated, of a pale rusty brown. Ocelli of both wings just a little more orange coloured than the ground-colour; that on the fore wing more faintly edged with black than the one on the hind wing. Fore wing: costa, grey-brown, faintly sprinkled on basal half with grey; the brown, thin, submarginal line, from the costa, which reaches the hind margin and also the sub-basal one on the hind wing very faint, and not having any white edge as is usual in *assamensis*. The sub-marginal band farther from the margin than in *assamensis*, and particularly on the hind margin, where it turns towards the base of the wing. This band consists of two fine black-brown lines merging apically and there outwardly edged whitish, the posterior half enclosing a faint whitish line and continued so on hind wing, below the markings and very suffused and obscure.

Type: ♀ in coll. J. Henry Watson (a rather poor specimen).

Hab.: Szechuen, West China; taken at light at Chengtu, May, 1922, by Rev. G. M. Franck.

Desgodinsia watsoni Obth.

Études Lep. Comp., 1913, fasc. 9, ii, p. 56, cclvi, fig. 2159.

This most interesting and rare insect, represented hitherto by the solitary type male in M. Oberthur's collection, which has not yet been generically diagnosed, has been discovered on the Mount of Omei by my friend and collector, Rev. G. M. Franck.

The type ♂ is from Ta-tsien-lu, Szechuen, West China, and Mr. Franck wrote me, after he had seen a photo of M. Oberthur's excellent figure of the ♂, under date 5/1/20:

"I will surely be on the look-out for that very rare moth you are so anxious to get. I am hoping to take my vacation on Mount Omei this summer, and if there is any place outside Ta-tsien-lu district where this moth is likely to be met with, Omei should be the spot."

It was, however, in 1921 that he was on Omei Shan, and 5th May, 1922, I got further information and this female specimen of what may prove to be a mountain race of this Saturnid:

"Last summer I spent my vacation on Mount Omei, but it was a very wet season and I got very few specimens, and among them nothing that would interest you except one that I cannot lay my hand on now. However, I got a few cocoons, and from one of these there hatched out the other day a moth which is very like *cynthia*; the markings are almost identical but the colouring is much richer. I have been thinking that perhaps it is that moth from Ta-tsien-lu that you have been wanting, only it is hardly large enough for that. I am not absolutely sure of the cocoon. . . . I cannot recall what the caterpillar fed on." (In litt.; 5th May, 1922).

The ♀ specimen duly came to hand and is a bred specimen, but has the tips of both fore wings broken, and I cannot give the exact length of fore wing. From the wings being broken (while the specimen is otherwise perfect) I infer that it is a nervous species, easily disturbed like *A. edwardsi* White, and not so sluggish as *Philosamia* Grote.

The genus *Desgodinsia* Obth. is intermediate between *Philosamia* Grote and *Archaeoattacus* Watson, but nearer to the first genus, from which it differs in not having the body tufted, the cells of both wings relatively wider, with the 1st and 2nd submedians and 3rd and 4th subcostals wider apart, due to the more obtuse angle formed at the junction of Sc. 3 and 4, and Sm. 1 and 2, Sm. 1 being nearer to Sc. 4 than in

Philosamia. Sm. 1 = IV3 and Sc. 4 = IV2 of Grote in Die Saturniden 1896.

This most interesting genus has the appearance of what one would imagine would be the result of the hybridisation of *Philosamia* and *Archaeoattacus*, and bears also a decided resemblance to the East African genus *Epiphora* Wallengren, particularly to the sawtooth black submarginal line on the fore wing (cf. *Epiphora rectifasciata* Roths., Nov. Zool., xv, 1908, pl. ix, fig. 3).

M. Oberthur's figure of the male, if drawn to natural size, has a fore wing length of 81 mm. The female from Omei Shan has a length of 69 mm. only. The female differs from the male figure in having less pronounced white lines, the general colouring being darker both above and below, the margins of both wings particularly, with the vitreous areas more angular and edged next to the vitreous with a cream line.

Type: ♀ in coll. J. Henry Watson.

Hab.: Szechuen, West China.

Larva taken on Omei Shan, summer, 1921; imago hatched May, 1922.

Withington;

May 11th, 1923.

PERONEA HASTIANA, L.: ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 153.)

Veterana Group.

Forms with brown or ochreous ground-colour to the superiors, and dark brown transverse markings.

(17) ab. *veterana* Hüb.

Synonymy.—Hüb. Verzeichniss, p. 385, No. 3741 (1826); Id. Tort. fig. 58 (1797) (*scabrana*); Charpentier, die Zinsler, p. 75 (1821) (*scabrana*); Treitschke, Schmett. von Eur. viii, p. 255 (1830) (*scabrana*); Kennel, Pal. Tort. pl. iii, fig. 24 (1908) (*hastiana* ab.).

Hübner figured and called (Tort., fig. 58) this form *scabrana* in 1797; in the same work he figured (fig. 169), and called, a totally different form by the same name; afterwards in Verzeichniss, p. 385, No. 3741 (1826), he renamed fig. 58 *veterana*, retaining the name *scabrana* for fig. 169. As fig. 169 agrees with Schiffermüller's description and fig. 58 does not, it is obvious that *veterana* must stand as the name for fig. 58. The following is a description of Hübner's figure:

The colour of the superiors, head and thorax is a light testaceous

brown, with darker lines and dots. Starting at the testaceous brown base, the central fascia, that usually is white in the forms possessing it, or at any rate paler than the surrounding areas, in ab. *veterana* is of the same colour as the remainder of the superiors: it is, however outlined with slender dark lines: there are two other transverse dark lines near the outer margin, the outer one being forked; along the costa of each superior is a series of five dark dashes. On the disc is a very singular character, consisting of four minute but prominent dots, arranged diamond-shape. This remarkable feature appears in every copy of Hübner I have been able to consult, but I never saw it in an actual specimen, and do not expect to do so. I can only presume it was a draughtsman's error appearing in the original drawings, and copied on the outlined plate from which the figures were coloured by hand. The hind wings are light grey with darker shading towards the outer margin.

Forms very similar to Hübner's fig. 58 are not uncommon in Britain. I have them from Wimbledon, Kent, Isle of Wight, and from Wicken, where it is common. It is, however, apparently a southern form. I have not seen specimens from the North of England or Scotland.

It is desirable here to refer to an error affecting what has hitherto been regarded as a *hastiana* form; I refer to the so-called ab. *sparsana* Schiff., described by him in S. V. p. 129 (1775). Charpentier in die Zinsler, p. 68 (1824) writes that Hübner's fig. 58 (*veterana*) is *sparsana*, Schiff., and as Charpentier saw and reported on the micros in Schiffermüller's collection, *sparsana* Schiff. has come down to us as a *hastiana* form; but Fabricius (Ent. Syst., tome iii. part 2, p. 246, 1794), who also went through Schiffermüller's collection many years before Charpentier did, says: "*Phalaena sparsana* (written by Fabricius in error *sponsana*) Wien Verz. 129. No. 1 = *sponsana* Fab." It will thus be seen that our well-known species, which we have hitherto known as *P. sponsana* Fab., = *P. sparsana* Schiff., and as the latter is the prior name it must bear it in future, and Fabricius' name *sponsana* falls. Schiffermüller's description "grey with light red markings" agrees with the species we have hitherto known as *sponsana* Fab.

(18) ab. *obsoletana* Stephs.

Synonymy.—Stephens, Haust. vol. iv, p. 156 (1834); Id., Cat. ii, p. 186, No. 7070 (1829); Curtis, Guide, 1st edn., p. 172 (1829); Rennie, Conspectus, p. 177 (1832); Curtis, Brit. Ent. 2nd edn., 16, No. 35 (post 1834); Id., Guide, 2nd edn., p. 202 (1837); Wood, Index Ent. No. 1074 (1839); Westwood, Brit. Moths, vol. ii, p. 162 (1845); Snellen, Vlind. Ned. Micr. p. 177 (1882); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Although Stephens in 1829, Curtis in 1829, and Rennie in 1832, use the name of this aberration prior to Stephens' description in 1834, yet these were merely catalogue names, without description, and therefore the name belongs to Stephens, as his description is the original one.

Original description.—Anterior wings brown, shining, nearly immaculate; with a very obsolete paler fascia placed somewhat obliquely near the base, and a subovate brown patch in the middle of the costa; posterior wings ashy brown (Stephens, *l.c.*).

A very careful examination of Stephens' type-specimen in the British Collection at the Natural History Museum leads one to the conclusion that it very closely resembles *ab. veterana* Hüb., although the description does not quite agree with Hübner's figure; the principal distinction I see is one that Stephens does not mention—a distinct red flush on the disc of the superiors. Brown forms agreeing with Stephens' description and having this flush are apparently rare. I have only seen two examples. Both of these come from the Bond Collection, and are labelled Wimbledon. Apparently *ab. obsoletana* is a southern form. Stephens writes of his type, "found by myself I believe at Ripley in 1827."

(19) *ab. subcristana* Stephs.

Synonymy.—Stephens, *Haust.* iv. p. 155 (1834); Curtis, *Brit. Ent.* 1st edn., 16, No. 37 (1824); *Id.*, *Guide*, 1st edn., p. 173 (1829); Stephens, *Cat.* ii, p. 186, No. 7067 (1829); Rennie, *Conspect.* p. 177 (1832); Curtis, *Brit. Ent.* 2nd edn., 16, No. 37 (post 1834); *Id.*, *Guide*, 2nd edn., p. 202 (1837); Wood, *Index Ent.* No. 1071 (1839); Westwood, *Brit. Moths*, vol. ii, pl. xciv, fig. 8, and p. 158 (1845); Snellen, *Vlind. Ned. Micr.* p. 177 (1882); Meyrick, *Gen. Ins.*, fasc. 149, p. 65 (1913).

As in the case of the last aberration, Curtis, Stephens and Rennie quote this name previous to 1834, but again theirs are merely catalogue names without description.

Original description.—Anterior wings dark glossy brown, with deeper clouds especially towards the costa, on which there is a dusky blotch; on the disc is an elevated, dark, but minute tuft of scales, and a few others towards the anal angle. Head, thorax and palpi ashy white. Posterior wings pale fuscous (Stephens, *l.c.*).

The type is in the British Collection at the Natural History Museum, and Wood's figure, quoted above, gives a very fair representation of it. As Wood had access to the whole of Stephens' Collection, there is no doubt but that he figured the actual type.

Ab. subcristana is a common form, but probably more a southern than a northern one. I have one example from Lochinver, and a number from Wicken Fen and the Isle of Wight, but my most

typical examples are from the Bond series, labelled Wimbledon. I have also one from the same series labelled Whittlebury Forest (Northamptonshire).

(20) *ab. coronana* Thunbg.

Synonymy.—Thunberg, *Insecta Suecica*, part i, p. 18, and pl. i, fig. 16 (1784); Curtis, *Guide*, 1st edn., p. 173 (1829); Stephens, *Cat.* ii, p. 186, No. 7068 (1829); Curtis, *Guide*, 2nd edn., p. 202 (1837); Westwood, *Brit. Moths*, vol. ii, p. 158, and pl. 94, fig. 4 (1845); Staudinger, *Cat. Lep. Eur.* ii, No. 652 (1871); Snellen, *Vlind. Ned. Micr.* p. 177 (1882); Staudinger, *Cat. Pal. Lep.* ii, p. 80, No. 1446 *a* (1901); Meyrick, *Gen. Ins.*, fasc. 149, p. 64 (1913).

Original description.—*Alis nigris: fascia obliqua dentata rubra*. Habitat in Westrogothia, Cl. Bjerkander. Magnitudo et fascies *T. heracleanae*, fusca tota. Alae anticae supra nigrae, nitidae margine externo et in primis postico ciliatae. Ante medium fascia obliqua, ferruginea, albo-marginata, antrorsum dentata, margines non tangens. Subtus pallidiores, unicolores. Posticae alae ciliatae cinereae utrinque. Fascia alarum cruribus anteriora spectat et coronam omnino refert (Thunberg, *l.c.*).

Ab. coronana was of course described from a Swedish specimen. It is extremely rare in Britain, if indeed there are any British examples of it. I have not seen one answering to Thunberg's description. The difficulty is to find a specimen agreeing with "ante medium fascia obliqua, ferruginea albo-marginata." I have seen numbers with a ferrugineous band, but not one in which it is margined with white. Of course, too, the dark portions of the superiors must be black, and not, as is usually the case in British *hastiana* forms, some shade of brown.

(21) *ab. bollingerana* Hüb.

Synonymy.—Hübner, *Verzeichniss*, p. 385, No. 3738 (1826); Id., *Tort.* fig. 61 (1797) (*byringerana*); Treitschke, *Schmett. von Eur.* viii, p. 257 (1830) (*sparsana*); Duponchel, *Lep. de France*, pl. cexliii, fig. 1, and vol. ix, p. 137 (1834) (*scabrana*); Wilkinson, *Brit. Tort.* pl. i, fig. 12 (1859); Heinemann, *Schmett. Deutsch*, i, p. 14 (1865); Snellen, *Vlind. Ned. Micr.*, p. 177 (1882) (*buringerana*); Spuler, *Schmett. Eur.* ii, p. 241 (1910) (*byringerana*); Meyrick, *Gen. Ins.* fasc. 149, p. 64 (1913) (*buringerana*).

Hübner figured this aberration in 1797 (*Tort.*, fig. 61), and named it *byringerana*, a name (*q.v.*) he had previously in Vogel given to a very unlike form. In 1826 (*Verzeichniss*, p. 385), realising his mistake, he renamed it *bollingerana*, and this name of course must stand, the name *byringerana* primarily given by him to it falling.

I have made the following description from his figure :

Head and palpi grey, thorax red brown ; the superiors have the red-brown basal area followed by the usual pale transverse band, which is ochreous in colour ; beyond this the whole of the apical portions—except a patch on the anal angle, and four small triangular patches on the costa—is of the same red-brown colour as the base, the patches being ochreous. The inferiors are light grey with dark veining, the abdomen is dark grey.

There is one noticeable peculiarity in Hübner's figure, making one doubt at first sight if it represents a form of *hastiana*, or some other species. The costa is very pronouncedly rounded from base to termen. It is difficult to account for this, except on the assumption that it is a draughtsman's error, for no other specimen or figure of *hastiana* I have seen has a rounded costa. Of course the basal portion is rounded, but not the remainder. There cannot be any doubt, however, that Hübner's figure refers to this species ; the characteristic markings, which pertain to no other Lepidopteron, are unmistakable.

Ab. *bollingerana* is a widely distributed and common form in Britain. I have examples from Wimbledon, Kent, Isle of Wight, Wicken Fen, Rannock, Lochinver, Soyea, and Sligo.

Autumnana Group.

Forms with pronouncedly raised tufts forming the margins of the pale transverse band.

(22) ab. *Autumnana* Hüb.

Synonymy.—Hübner, Tort. fig. 247 (1818) ; Id., Verz. p. 384, No. 3716 (1826) ; Stephens, Cat. ii, p. 186, No. 7066 (1829) ; Curtis, Guide, 1st edn. p. 173 (1829) ; Rennie, Conspect. p. 177 (1832) ; Stephens, Haust. iv, p. 155 (1834) ; Curtis, Brit. Ent. 2nd edn., 16, No. 33 (post 1834) ; Id., Guide, 2nd edn., p. 202 (1837) ; Wood, Index Ent. No. 1070 (1839) ; Herrich Schäffer, vol. iv, Tort. pl. ii, fig. 20 (1847) (*lucidana*) ; Westwood, Brit. Moths, vol. ii, pl. xciv, fig. 1, and p. 157 (1845) ; Staudinger, Cat. Lep. Eur. ii, No. 652 (1871) ; Snellen, Vlind. Ned. Micr. p. 177 (1882) ; Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1446f (1901) ; Kennel, Pal. Tort. pl. iii, fig. 23 (1908) ; Spuler, Schmett. Eur. ii, p. 241 (1910) ; Meyrick, Gen. Ins., fasc. 149, p. 65 (1913).

Hübner figured and named ab. *autumnana*, but as he did not describe it I have made the following description from his figure :

Head, thorax and superiors ochreous brown, paler at the base of the superiors ; at the shoulder is a dark brown dash ; the costa has the triangular dark blotch common to so many *hastiana* forms ; the inferiors are grey, darker near the outer margin.

Ab. autumnana is a not uncommon and widely distributed form. I have examples of it from Kent, the Isle of Wight, Wicken, Wimbledon, and Lochinver.

(To be continued.)

PLANT GALLS COLLECTED NEAR PORLOCK AND MINEHEAD, SOMERSET, JUNE-JULY, 1922.

By L. B. HALL, F.L.S.

THE area in which the galls listed here were found lies between Culbone in the west and Old Cleeve in the east.

On—

<i>Euonymus europaeus</i> L.	<i>Aphis euonymi</i> Fabr. <i>Eriophyes convolvens</i> Nal.
<i>Acer pseudoplatanus</i> L.	<i>Eriophyes macrorrhynchus</i> Nal.
<i>Acer campestre</i> L.	Ditto.
<i>Prunus spinosa</i> L.	<i>Eriophyes padi</i> Nal. <i>Eriophyes similis</i> Nal.
<i>Spiraea ulmaria</i> L.	<i>Perrisia ulmariae</i> Brem.
<i>Rosa</i> sp.	<i>Rhodites rosae</i> L. <i>R. eglanteriae</i> Hartig. <i>Perrisia rosarum</i> Hardy.
<i>Pyrus aria</i> Ehrh. var. <i>rupicola</i> Syme	<i>Eriophyes pyri</i> Pagenst.
<i>Pyrus aucuparia</i> Ehrh.	<i>Eriophyes pyri</i> Pagenst.
<i>Crataegus monogyna</i> Jacq.	<i>Perrisia crataegi</i> Winn. <i>Myzus oxyacanthae</i> Koch. <i>Eriophyes goniothorax</i> Nal.
<i>Rubia peregrina</i> L.	<i>Eriophyes rubiae</i> Can.
<i>Galium mollugo</i> L.	<i>Perrisia galii</i> F. Löw. <i>Eriophyes galii</i> Karp.
<i>Galium aparine</i> L.	Ditto.
<i>Fraxinus excelsior</i> L.	<i>Perrisia fraxini</i> Kieff. <i>Psyllopsis fraxini</i> L. <i>Eriophyes fraxini</i> Karp.
<i>Veronica chamaedrys</i> L.	<i>Perrisia veronicae</i> Vallot.
<i>Thymus serpyllum</i> L.	<i>Eriophyes thomasi</i> Nal.
<i>Ulmus campestris</i> L.	<i>Schizoneura ulmi</i> L.
<i>Urtica dioica</i> L.	<i>Perrisia urticae</i> Perris.
<i>Betula alba</i> L.	<i>Eriophyes rudis</i> Can.
<i>Betula pubescens</i> Ehrh.	Ditto. <i>Eriophyes lionotus</i> Nal.
<i>Alnus rotundifolia</i> Mill	<i>Eriophyes laevis</i> Nal. <i>E. nalepai</i> Fockeu. <i>E. brevitarsus</i> Fockeu.
<i>Corylus avellana</i> L.	<i>Eriophyes avellanae</i> Nal.
<i>Juglans regia</i> L.	<i>Eriophyes tristriatus</i> var. <i>erinea</i> Nal.

Quercus robur L. (pedunculata = ped. (Ehrh.), intermedia = int. (D. Don.), sessiliflora = sess. (Salisb.))	<i>Andricus curvator</i> Hartig. on int. and sess. <i>A. inflator</i> Hartig. on ped. <i>Biorrhiza pallida</i> Oliv. on sess. <i>Cynips kollari</i> Hartig. on sess. <i>Neuroterus baccarum</i> L. on int. and sess. <i>Neuroterus vesicator</i> Schl. on ped., int. and sess. <i>Macrodiplosis dryobia</i> F. Löw. on ped. and sess. <i>M. volvens</i> Kieff on ped. and sess. <i>Trioza remota</i> Förster on ped. <i>Oligotrophus annulipes</i> Hartig. <i>Eriophyes stenaspis</i> Nal. <i>E. nervisequus</i> Can. var. <i>maculifer</i> Trotter.
Fagus sylvatica L.	<i>Pontania proxima</i> Lepel. <i>Pontania salicis</i> Christ. <i>Rhabdophaga salicis</i> Schrank.
Salix fragilis L.	<i>Pontania proxima</i> Lepel.
S. pupurea L.	Ditto.
Salix caprea L.	<i>Pontania pedunculi</i> Hartig.
Salix cinerea L.	<i>Oligotrophus capreae</i> Winn. <i>Phyllocoptes populi</i> Nal.
Populus tremula L.	<i>Pemphigus affinis</i> Kalt.
Populus nigra L.	<i>P. bursarius</i> L. <i>P. marsupialis</i> Courcehet. <i>P. spirothecae</i> Pass.
Picea excelsa Link.	<i>Chermes</i> sp. (<i>viridis</i> or <i>abietis</i>).
Juncus sp.	<i>Livia juncorum</i> Latr.
Pteris aquilina L.	<i>Anthomyia signata</i> Brischke.
Athyrium filix-foemina Roth.	Ditto.
Lastraea filix-mas Presl.	Ditto.

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Winchmore Hill, N. 21.

OBSERVATIONS ON THE LIFE-HISTORIES AND HABITS OF *ALLANTUS PALLIPES* SPIN. AND *PRISTIPHORA* *PALLIPES* LEP. (HYM. TENTH.)

BY MISS E. F. CHAWNER and A. D. PEACOCK, M.Sc.

(Concluded from p. 128.)

LARVAE.

To escape from the leaf the larva cuts a broad C-shaped hole in the thin underside tissue surrounding the egg. The new larva is 2.75 mm. long with head and body of a white or very pale grey colour. A greenish tinge is afterwards assumed as the result of the

food eaten. Feeding takes place at night and day at this stage. Older larvae, though they may feed after dusk, feed chiefly in early morning before nine o'clock, and hide during the day, being difficult to detect among the stems and roots and even, at times, just beneath the ground. They feed voraciously upon the leaves of garden violet (*Viola odorata*) and viola (*V. tricolor*), and in captivity may attack the stalks as well. At Lyndhurst they fed on violet, consuming a large number of leaves, but did not touch the stalks or large veins unless nothing else was to be had. They preferred adult but not old leaves.

"The curious thing was that the species kept to so small a space, for there were pansies here and there right across the garden and up to and alongside a large violet bed, but these pansies in the open and the violets under the shade of apple trees were quite free from the larvae." [Similar observations were made at Lyndhurst also.] "That same year or the next I found the species on Dartmoor among *Viola canina*, in places where several of the fritillary butterflies breed. I only bred actually two broods, but I was away from the end of July till September, and I am sure there could not have been less than four owing to the dates when small larvae were observed."

Despite the suggestion from a former name, *E. grossulariae* Klug., young larvae 5 mm. long refuse gooseberry. The larvae moult for the first time when about 8 mm. (about 12 days old). The adult larva corresponds exactly in colour, size and shape to *E. carpini* Htg. as described by Cameron in *Phytophagous Hymenoptera*, vol. i. and has probably been confused with it, though *carpini* is known to feed on *Geranium robertianum*. After the last moult, when 10 mm. in length, they are grey and wrinkled, devoid of all tubercles and spines, and with the vertex a dark slate colour instead of the former deep, shining black.

The full-fed larva, head foremost, bores a tunnel into rotten or soft wood, the burrow being just wide enough for it. The excavation ends blindly, and the entrance hole is plugged, but not tightly, with sawdust made by the larva. On examining the tunnels a few days after making, most of the larvae have been found with the head pointed toward the open end, so permitting an easy escape for the future imago. In the majority of cases where the larva has been found with his head toward the blind end it is probable that the burrow has been opened before the larva has orientated itself in the typical fashion. Even if the larva remained in such a position it does not necessarily follow that the imago could not escape, for many Hymenoptera emerge hind end foremost. Ensconsed in its burrow the larva has its head and posterior tucked closely ventrad. How the caterpillar orientates itself finally in its burrow has not been observed, but in one case a specimen just after finishing its

boring was found with a peculiar twist in its body as if attempting to reverse its head towards the open end. Specimens in captivity have never been observed to leave the completed burrow and re-enter tail first. Neither have imagines been observed to emerge from newly cut exit holes.

That the boring instinct is transitory and only lasts a matter of 4 days is illustrated in the following experiment.

Oct. 13th, 1921 : 7 larvae removed from tunnels in which they had lain about 1 day; 3 placed on fresh piece of rotten wood and 4 about $\frac{1}{2}$ inch from it in a tin.

Oct. 14th : All except 2 have bored in ; 1 remains at bottom of tin and the other on top of tin.

Oct. 15th : All in wood, 5 out of 7 with head toward open end of tunnel ; probably two exceptions are the most recent burrowers ; one specimen with peculiar twist in body as if turning head toward open end ; all removed again from wood and placed near it.

Oct. 16th-19th : 5 still out, where they have remained for months.

PUPAE.

The pupa is found inside the larval skin. It is white until just prior to emerging, when it turns pale blue, then a darker blue until the imaginal black is assumed. It has been found at Lyndhurst that some of the larvae of the summer generation do not metamorphose, and presumably they do not hatch until the following spring, but their fate is not precisely known. In the case of over 50 summer generation specimens bred at Ryton no lingerers have been discovered. The hibernating larvae evidently do not become pupae until close on the time of emergence, as specimens dissected on Feb. 22nd, 1922, showed no striking features of metamorphosis except that the ovaries had certainly developed and grown.

Pristiphora pallipes.

Time records of stages.

At Lyndhurst.

	1920.
Second summer generation.	July 30: Larva found on gooseberry bush.
	Aug. 4: Spun a brown cocoon.
	„ 13: Female emerged; eggs laid.
Hibernating generation.	„ 23: Larvae hatching.
	Sept. 7-15: Spinning; cocoons greenish white, in most cases turning yellowish.
	1921.
First summer generation.	April 3: Male out.
	June 21: 2 females out; eggs laid.
	„ 29: Many larvae hatched.
	July 12: Spinning.
	„ 20: 25-30 females.

		At Ryton.	
		From laboratory specimens.	From wild specimens.
First summer generation.	1921. July 20:	Many females from Lyndhurst cocoons; eggs at once; certain cocoons still intact.	
	„ 26:	Larvae out.	
Second summer generation.	Aug. 11:	Cocoons spun.	Aug. 13: Larvae found at Muggleswick, co. Durham, on gooseberry.
	„ 25-Sept. 1:	Many females hatching; 4 cocoons intact.	„ 18-19: Cocoons.
			„ 31-Sept. 5: Females out; eggs laid same day.
Hibernating generation.	Sept. 3, 5, 6, Oct. 4:	Larvae from cocoon found.	Oct. 4: Cocoons found.
	1922. April 4:	1 female from cocoon of first summer generation of 1921.	

Particulars of several rearing experiments carried on in parallel at Ryton have not been detailed in the foregoing, but have been incorporated in the following summary:

Summary of above Results.

	First summer generation.	Second summer generation.	Hibernating generation.
Incubation period . . .	8 days	6 days	10 days (1920). 7-8 „ (1921).
Larval period . . .	13 „	15 „	22-23 „ (from collected specs.).
Pupation period . . .	8 „ (266 days in the case of lingering female specimen)	9 14 „	209 days (male). 288 „ (female).
Total period from egg to egg-laying . . .	29 days	30-35 „	238 „ (male). 321 „ (female).

Except in a few cases where cocoons remain intact and imaginal emergence is postponed, the two summer generations are speedily completed, each in about one calendar month, the corresponding stages of the life-history of each generation being approximately

equal in duration. The larval period of the autumn generation appears about a week longer than that of either summer generation. It is a point of interest that the earliest dates of emergence of the solitary forerunners of the two hibernating generations of 1920-21 and 1921-22 correspond so closely, the male hatching Apr. 3, 1921, and the female Apr. 4, 1922. The latter emergence disposed of the idea, which occurred to us as the result of the 1920-21 work, that males may have been overlooked by collectors hitherto owing to their appearance so early in the year and so far anterior to that of the females.

HABITS.

Parthenogenesis.—The laboratory strain was started with a single larva—evidently of the second summer generation—found wild, which after pupation produced a female. Whether the larva was sexually produced or not cannot, of course, be stated. The succession of events from this female may be summarised thus :

1920. 1 second summer generation female.

1920 and 1921. F 1 ; hibernating generation consisting of 1 male and 2 females.

1921. F 2 ; first summer generation consisting of 31 females and certain cocoons which remain intact. F 3 ; second summer generation consisting of 54 females, 4 not hatched yet and 4 which died before hatching.

1921 and 1922. F 4 ; hibernating generations ; not emerged yet.

The points of interest are: (1) The parthenogenetic eggs of the ancestress yielded adults of both sexes—1 male and 2 females ; (2) this male emerged $2\frac{1}{2}$ months before the females of the same generation ; (3) no more males have been produced since the F 1 generation, though an F 2 generation of 31 females and an F 3 generation of 54 females (plus 4 not emerged yet) have been reared ; (4) a few of the first and second summer generations, apparently healthy, hibernate. Specimens of the F 2 generation reared by Mr. Morice also were all females.

In the case of the wild specimens collected in the North and belonging, presumably, to the second summer generation, 8 cocoons yielded 5 females and 3 ichneumons, there being no lingerers. The females laid parthenogenetically and their offspring are now hibernating.

Eggs have been obtained parthenogenetically from females which never have fed but have had access to moisture of condensation on their glass cages. One unfed individual in handling was so injured at the base of the abdomen on the left side that ovarian tubes were ruptured and allowed the escape at the injury of six eggs, one or two apparently ready for laying. However, the fly fed on sugar syrup, and, whilst waving the right hind leg about in a curious

fashion, made many abortive attempts at laying. Eventually two eggs were obtained, but only one larva which spun.

Viability.—Under experimental conditions adults lived for about 6 days only—that is, during the ovipositing period.

Feeding.—Observations were carried out in the following manner. A small drop or smear of thick sugar syrup was placed on the bottom of a petridish, which was then inverted over a fly. When the insect, upside down, was observed to feed, the process was watched by means of a binocular microscope. Neither mandibles nor palps play any part in ingestion. The former lie at rest, while the latter become elbowed with their tips touching the glass or food indifferently, and out of the way of the active maxillae and labium. The syrup was gathered to the mouth by the rapid side-to-side movements of the maxillae and the synchronous forward and backward wash of the labium. The stationary labrum prevented any escape of the food. The ingesting parts worked at the rate of about 200 beats per minute.

Egg-laying.—The newly emerged flies lay immediately. They support themselves on the leaf the with feet of one side gripping the upper surface and the legs of the other side gripping the under surface. A slit is made in the edge of the leaf, also at times in a large vein, and the somewhat large egg lies between the leaf's two surfaces. In captivity one or two eggs to each leaf is usual, but in one experiment where three flies occupied the same cage about ten eggs to the leaf have been obtained. As the eggs grow they give the leaf a beaded appearance and they are visible through the slit. They are not always firmly held or fixed in the cavity, as one has been seen dislodged and lying half in and half out.

Three flies used in one cage gave a total of at least 80 eggs during 6 days, the greater majority being deposited during the first two or three days.

LARVAE.

On hatching, the young are pale green with brown heads. They feed along the leaf edge and rear the posterior of the body. In one experiment where a large number of eggs had been laid in one leaf the newly hatched larvae with upreared bodies gave the leaf a fringed appearance. While devouring their foodstuff they do not touch unhatched eggs still in the pocket, and they also leave a stalk of tissue sufficient to support the egg. The adult colouring—green and black shiny head—is assumed in about a week. Before spinning, their colour becomes a very bright shining green with vertex and the circum-orbital regions black, their length being 9 mm.

The spinning faculty is transitory and short-lived. A single brown cocoon nearly a day old was almost bisected to watch the behaviour of the larva inside. The mouth-parts worked in a manner

grotesquely resembling a human trying to froth up saliva in a closed mouth: the labium was thrust forward among the frayed silk and then the head was reared backwards as if drawing out a silk thread. But only occasionally was any thread spun, and finally, after a few minutes' vain effort, the larva forsook the cocoon. For a day afterwards no further success attended the larva and it was taken for dissection.

PUPAE.

The cocoons, which may be brown or yellow, are laid beneath, or between, and attached to leaves or on the soil or other surface of the breeding-cage. The conditions determining the colour difference of the cocoon have not been determined.

NOTES AND OBSERVATIONS.

PERONEA HASTIANA.—With respect to Mr. Meyrick's remarks on page 162, immediately the June number of this magazine was issued several readers courteously wrote to point out an error in the interpretation of the German word "trapezförmigen" in my paper. As, however, the correct place for errata is at the end of a paper, and not in the body of the magazine during its issue, for obvious reasons I deferred dealing with this, and certain other matters that will require attention, until then.

It is about half a century since I studied geometrical problems, or even opened a copy of Euclid; and at the end of a much less period than this, unless indeed for some reason one has occasion to keep in memory what was learnt at school, it is not infrequently found that a great portion of it has been forgotten.

Feeling uncertain as to the exact meaning of the word, a source was consulted I felt confident could be relied upon. I ought, of course, to have confirmed the information obtained by referring it, but being very busy with other matters at the time the reference was overlooked.—W. G. SHELDON.

A POSSIBLE AGRIADES BELLARGUS $\times$ A. CORIDON HYBRID.—I had a great surprise a few evenings ago—June 24th to be precise—when out working *Agriades bellargus* on the North Downs near here. I took a fine ♂ *A. coridon*, or at least what appears to be this species, complete with black margins, although the ground-colour is somewhat bluer than usual. This is about six weeks before normal time of appearance, and in a late season too. Do you think it might be a wild hybrid *bellargus* $\times$ *coridon*, and favouring the former as to time of appearance? Unfortunately I could not find another although I worked the spot closely for a week afterwards, but I think it worth recording.—A. E. TONGE; "Aincroft," Grammar School Hill, Reigate, July 3rd, 1923.

[This is a well-known but rare occurrence. The name of the form is *polonus* Zell. The question is gone into very fully in Tutt's *Brit. Lep.*, x, pp. 323–324.—W. G. S.]

SESIA SPECIFORMIS GERN. IN SURREY.—While collecting at Oxshott on the 29th June I took a specimen of *S. speciformis* at

rest on a leaf of poplar. It would be interesting to know of any previous records of the species from this district.—A. S. BUCKHURST, F.E.S.; 9, Souldern Road, London, W. 14.

HELIOTHIS PELTIGERA IN FEBRUARY.—I see in the May number of the Entomologist (p. 114) a note on *Heliothis peltigera*. I caught a specimen on February 25th, 1923, near Sherborne. Is not this a very early date for the species?—W. MICHELMORE; Westcott House, Sherborne, Dorset.

GELECHIA PLANTAGINELLA NOT IN GLOUCESTERSHIRE.—Referring to my notes (Entom., lv, p. 155) Mr. E. Meyrick, F.R.S., writes (in litt.) as follows: "I hasten to apologise for and rectify an error. I have recently had to examine a considerable number of *Gelechia plantaginella* from localities ranging from Bohemia to the Shetlands, and I now perceive that the Gloucester species (of which you kindly gave me six fine specimens) to which I assigned this name was wrongly identified, and is really *G. artemisiella*. I am sorry I misled you. The group is a difficult one."—C. GRANVILLE CLUTTERBUCK, F.E.S. 23, Heathville Road, Gloucester.

EARLY APPEARANCE OF SPILOSOMA LUBRICEPEDA.—On April 23rd, 1923, I found two *S. lubricepeda* ♀ at rest on a wall at Tring. It was quite a cold morning, and the weather had been cold for some days before. Apparently they had emerged that morning, as they were in perfect condition.—G. E. TITE; 18, Park Road, Tring.

LATE APPEARANCE OF BUTTERFLIES IN BUCKS.—In one locality in the Chilterns *Nisoniades tages* appeared on May 26th, but in another locality on the hills freshly emerged specimens were flying a month later, while two fine specimens were seen on July 7th.* *Brenthis euphrosyne* was first seen on June 23rd, *Aricia medon* on June 30th, *Argiades sylvanus* and *Polyommatus icarus* on July 7th. These late appearances seem rather remarkable in view of the mild winter, but most likely the cold spring has retarded their emergence.—J. A. S. BROWN; "Keston," Whitchurch Lane, Edgware, Middlesex, July 9th, 1923.

ABNORMAL PAIRING.—Whilst watching the bramble bloom I was surprised to see a ♂ *Epinephile jurtina* and a ♀ *Aphantopus hyperanthus* in cop. I netted them and put them in killing bottle hoping they would die without separating. This they did, so I am able to send you them intact.—HERBERT W. M. BAKER; 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.

NOTES FROM THE COTSWOLD HILLS, JUNE, 1923.—I spent a very pleasant fortnight in the Cotswold Hills from the 16th to 30th June. *Lycaena arion* was of course the main object of my visit, but I did not get it. I heard nothing of the butterfly until June 23rd, on which date half a dozen were taken by a Gloucester collector. I understand that this was the first really hot sunny day in the district since the beginning of May. Several local gentlemen very kindly helped me with information as to localities, but the weather turned dull again until just before I left. Insects generally were by no means abundant, and the presence of *Brenthis euphrosyne*, *Hesperia malvae* and *Thanaos*

* The species was also seen in fresh condition at Box Hill about the same date.—R. S.

tages in excellent condition during the last week of June speaks for itself as to the backwardness of the season. *Lycaena bellargus* emerged daily in one locality, but only in small numbers, and was never plentiful. The females were sometimes exceptionally well scaled with blue. Few *Polyommatus icarus* were noticed until the last week, when it became common. A considerable proportion of the females approached or equalled var. *cyerulea*. One male was taken with all spots except discoidal obsolete on secondaries, and the same form occurred in *Aricia medon*, which not infrequently showed partial obsolescence. Most of the spring butterflies were noted, generally in good order. Odd specimens of *Melitaea artemis* turned up. *Pararge egeria* var. *egerides* 2nd brood was emerging when I left. *Ino geryon* swarmed on one or two hillsides, and *Parasemia plantaginis* and *Macrothylacia rubi* were common. Several *Hemaris bombylifformis* were taken or seen. Sugar was tried night after night in the beech woods but was almost a complete failure. *Thyatira batis* was the only moth which came in any numbers, and very few insects were seen on the wing.—S. B. HODGSON; 3 Bassett Road, North Kensington.

MELANISM IN LEPIDOPTERA.—Mr. Porritt misunderstands me when he supposes that I regard all melanic forms of animal life as cases of acquired melanism: on the contrary I distinctly expressed my conviction that all were originally either black, brown or white or combinations of these hues, and that the more attractive colours had been acquired subsequently either by sexual selection or for protective purposes. I have repeatedly seen a female butterfly reject and avoid the advances of one or more males of its species and subsequently accept a later arrival. That a male butterfly might accept a crippled female proves nothing; there have been cases in which male birds have paired up with crippled females. To assume that animals of various kinds show no preference for special colours is to ignore well-established and proved facts, as for instance the preference of the Satin Bowerbird for blue, which probably explains why it is brilliantly glossed with that colour and has dazzling blue irides.

I was at first puzzled by Mr. Porritt's reference to *Tanagra atrata*,* but it has been explained to me that this is the most recent name given to the Chimney-sweeper Moth; I have hitherto only associated the generic name *Tanagra* with a group of Tanagers (fruit-eating, finch-like birds). I should not regard the Chimney-sweeper as a case of melanism in the accepted sense, but as a melanic form which had retained its pristine colouring, probably for protective purposes: I also do not doubt that the Peppered Moth has for many years past been acquiring its melanistic colouring for a similar reason.

Mr. Beebe's experiments with birds in America and his study of forms of the same species obtained in different States distinctly favoured the view that moist heat intensified colouring; as also my own observations in regard to the markings on eggs, those laid in more or less darkened nesting sites being frequently white, and generally either unmarked or very slightly so. Warmth and moisture had the opposite effect.

Mr. Porritt misses my point entirely when he says that the white primrose ought to increase year by year, to the ultimate exclusion of the yellow flowers; that is exactly what I contend that its delicacy

* *Odezia* should be used for the Lepidopterous genus.—N. D. R.

prevents. Close inbreeding which has been shown to favour albinism in the progeny is not a strengthening process, nor do I believe that those animals which assume white colouring at the approach of winter do so as a result of more vigorous vitality any more than the white hair which is assumed by human beings in old age.

Mr. Porritt speaks of his more than sixty years' experience. Well, that ought to go for something; but I might reply that I began to study Lepidoptera when I was seven (seventy-two years ago), and not only British species, but, for thirty-eight and a half years, beginning in 1863, I studied the Lepidoptera (and I might say Arthropoda) of the world, so that I was in a position to take a broader view than if I had strictly confined my study to British Lepidoptera. Moreover, in 1871 I began to study nests and eggs and later birds themselves, both British and foreign. But after all, as that good man Charles Darwin used to say, "How little we know," or as another good man said, "If any man think that he knoweth anything, he knoweth nothing yet as he ought to know."

If conditions always remained the same one would not expect species to change much even in three thousand years: but since the Creation there have been many enormous alterations of temperature, in the distribution of land and water, in subsidence and upheaval of the surface of the globe, all of which have produced modifications in species.—A. G. BUTLER.

VARIATION IN LEPIDOPTERA.—Dr. A. G. Butler, in his rejoinder to Mr. G. T. Porritt, is surprised that "any follower of Darwin or anyone who has examined such more recent fossil Lepidoptera as have retained their pattern and colouring can come to any other conclusion" than his own about the original colours of Lepidoptera.

The evidence in favour of this view, however, does not seem to warrant his confidence. It is scarcely surprising that fossil Lepidoptera should "exhibit these sombre hues" (as Dr. Butler naïvely remarks): it would be a good deal more so if they showed traces of any brilliant colour. The comparatively fugitive nature of all bright colours in our present Lepidoptera, with the exception of metallic blue and green (and even these are by no means permanent), must be a commonplace to all collectors, as the "butterfly pictures" of a past generation can testify, and although doubtlessly fossil Lepidoptera were not exposed to light, he would be a rash man who asserted that their colours were unchanged.

Again, even if it were possible to prove that the colours of these fossil insects are absolutely reliable, the number of species preserved as fossils must from the fragile nature of the subjects be so small a proportion of the whole, as to render any judgment based on them nothing more than a deduction from totally insufficient data, or in other words, mere guesswork.

The odds are that an English fossil of to-day would be of an abounding species like *E. jurtina* or *A. exclamatoria*, sombre enough for anyone.

Again, what proof has Dr. Butler that the collateral ancestors of the Dasyophthalmas were coloured as their present-day representatives? Might not Mr. Porritt just as legitimately assert that they had evolved to their present black and white from a primitive pink and green colour scheme?

So far I have simply approached this question from the negative

side, actuated I presume by the same motive as Mr. Porritt—a dislike of unsupported dogma.

But there is, I fancy, a certain amount of evidence to show that whereas mottled browns may have been the primitive colours of Lepidoptera, blacks and whites are unlikely to have been, and hence reversion is useless as a theory to account for melanism or albinism.

Such evidence must, of course, from the imperfection of the geological record, be purely analogical.

So far as I can ascertain in the majority (certainly not all, but still the greater proportion) of black, white, and pied animals of the present day, particularly among the birds, the black, white or pied coloration is assumed on attaining sexual maturity. The gulls, blackbirds, cormorants, swans, and ducks of many species among the birds, and the Malayan tapir and harp seal in mammals, are examples that occur to me off-hand; of these the immature animals are all duskily striped or spotted. I believe it is generally held that immature colouring affords the best guide to the primitive colours of an animal; certainly Darwin held this view (*cf.* the *Descent of Man*, Chapters 15, 16 and elsewhere). Hence, if among other divisions of the animal kingdom, black, white, and pied colours are a late development in the majority of cases, it seems unlikely that they are primitive among Lepidoptera. These black, white, and pied varieties that crop up among mammals and birds periodically thus appear to be simply chance aberrations, of which possibly Nature might take advantage, and not reversions.

To argue from them, indeed, as Dr. Butler has done, ends in a paradox, as, for instance, in the rabbit, pheasant and sparrow, of all of which I have seen both black and white varieties wild. If these are to be regarded as reversions their ancestors must have been black and at the same time white, which is absurd, unless we are to regard all primitive species as unfixed in colour, in which case the whole argument becomes absurd, as anything may be termed a reversion.

As most unfortunately Lepidoptera have no immature colour stage outside the chrysalis, not even a teneral one as in the Odonata, the argument can be pushed no further.

There is one present-day factor to which I have seen no reference in *The Entomologist* (possibly an oversight on my part), which will, I think, cause increasing variation in Lepidoptera in future. The development in cultivated and building land which has taken place in the last 150 years is tending to isolate species more and more into colonies. Where perhaps a woodland or downland species had a run of a hundred miles of country in former days, it now frequently has perhaps a dozen stretches of five or six miles, between which intercommunication is infrequent. It is a commonplace that when a species becomes fixed to one spot it is more likely to develop variation, caused by all the breeding specimens being subjected to exactly the same conditions, than when the same breeding specimens "overlap," so to speak, through a big range of country, and this may prove a factor in causing melanism as in other variation.

Albinism is, I believe, chiefly a morbid state produced by unsuitable food and inbreeding (a pheasant breeder usually seeks new blood when pied birds appear in his coverts), and as such is of comparatively little interest to me.

The whole subject is, however, far too large to be developed further here, I shall nevertheless be interested to see if Dr. Butler can prove anything further about the colours of Lepidoptera, as I am quite without prejudice on the subject, and should be glad to be converted to any theory which satisfactorily explained the puzzle of melanism.

I venture to suggest that no ground can be found in Mr. Porritt's letter for believing him to hold the view of a series of special creations; hence Dr. Butler has wasted a large part of his letter in recapitulating what every schoolboy of fourteen to-day knows of natural and sexual selection. H. C. HUGGINS: Oldestede Cottage, Chestnut Street, near Sittingbourne.

A NOTE ON *MOGIS UNDATA* FABRICIUS (LEP. NOCTUIDAE).—Warren gives the name of *bifasciata* to Hampson's ab. 4 from the Philippine Islands (*vide* Hampson, *Cat. Lep. Phil.*, xiii, p. 92, and Warren, *Seitz's Gross. Schmett. Pal.*, iii, p. 333, 1913). Unfortunately this name is already preoccupied by *bifasciata* Walker (= *virbia* Cramer), (*vide* Walker, *Cat.*, xxxiii, p. 1014, 1865), therefore I rename ab. 4 *uberia* n.n. Male type from Philippine Islands in Coll. Brit. Mus. A. E. WILEMAN.

FUND FOR RUSSIAN ENTOMOLOGISTS IN DISTRESS. Those kind friends who were good enough to subscribe to our fund for the assistance of our Russian colleagues in distress will be interested to learn that an official receipt for £6 sent has been received from the Secretary of the Russian Entomological Society, and also a letter from A. P. Semenov-Tian-Shansky, Hon. F.E.S., their President, expressing their gratitude to the Entomological Society of London for its *beau geste*, and to those Fellows and Entomologists personally who contributed so generously. The money is being applied as the nucleus of a fund administered by the Russian Entomological Society, for the assistance of Russian Entomologists in distress.

In the meanwhile some more donations have been received and remitted. We trust that it will not be considered that the fund is closed. We earnestly hope that it is very much alive, and will remain so so long as any of our less happily placed colleagues, who are still doing most valuable work under difficult circumstances, are in genuine and deep distress.

B. P. UVAROV, F.E.S., Natural History Museum, S.W. 7.

ARTHUR DICKSEE, F.E.S., 7, Duke Street, St. James's Street, S.W. 1.

M. BURR, D.Sc., F.E.S., Cox's Mill, Dallington, Sussex.

RECENT LITERATURE.

Manual of Entomology, with Special Reference to Economic Entomology.

By H. MAXWELL LEFROY, M.A., Professor of Entomology, Imperial College of Science and Technology. Pp. xvi + 541, 4 plates and 179 text-figures. London: Edward Arnold & Co., 1923. Price 35s. net.

THE author states in his preface that this volume is based upon the lectures given as the second of three parts of a course occupying one year of a full training in economic entomology. That statement

explains to some extent why his Manual of Entomology contains nothing in the nature of a general introduction to the study of insects, and why, therefore, it seems so little adapted to meet the requirements of the student who has had no preliminary training in entomology or general zoology. Professor Lefroy attempts, he says, to interest the bionomist and the economic man. But a glance at the pages of contents suggests at once that this manual should have a wider interest than that which is modestly claimed for it by the author. In the contents is shown a scheme of classification in which existing insects are divided into 2 sub-classes, 26 orders and more than 400 families, of which less than one-fourth are indicated as being of importance to the student of economic entomology. These various divisions, ranging from sub-classes to families, or sometimes even to sub-families, are treated of in the text, as far as possible, in the following sequence: Name, popular name, diagnosis (in heavy type), geographical distribution, appearance and recognition in the field, external structure, sex recognition, internal structure, life-history, habitat, food, literature, authorities, economic importance. "The unusual, the 'romantic' is cut out; there is," says Professor Lefroy, "no romance of nature, but the solid sober facts of the habits and life-histories, so far as we know them, of the usual insects."

One of the chief faults to be found with this Manual is that it displays too great a tendency to disregard the unusual, and to draw general conclusions from what are considered to be the characters of the usual insects. For this reason the diagnostic characters given are sometimes misleading, and frequently serve no useful purpose.

No one man, even with the assistance of eight or nine capable and enthusiastic young students, could hope to escape all the pitfalls which beset an attempt to deal adequately with something like 440 different families of insects: and, needless to say, this book is by no means free from mistakes. Within the limits imposed, the treatment of some of the orders in this volume is admirable of its kind, and appears to be exceptionally free from error. But, unfortunately, this cannot be said of all. To the Coleoptera, being the largest, and one of the most important of the orders, most space is given. The treatment accorded it, however, suggests a hasty compilation made by a man who had but a superficial knowledge of the group, and no clear conception of the relative value of morphological characters, of the distinction to be drawn between a monograph and a list of species, or between the name of an author and the name of a town. Why the Coleoptera should be placed in the scheme of classification between the earwigs and the bugs is a point left unexplained. They would seem more naturally placed among the orders which are characterised by a complete metamorphosis, near, say, the Megaloptera and Neuroptera. In the text the Megaloptera have the name *Perlaria* added as a synonym—an obvious slip which should have been corrected in the proof-reading, the name *Perlaria* being rightly given elsewhere as a synonym of Plecoptera. The proof-reading, however, has not been very well done; the misprints are fairly numerous. On p. 200, for instance, there are three in succession, *Cerambycidae* (*Disteriinae* to *Septurinae*), and on p. 208 we find *Xyleborons* and *Xyleberus* as if they were two distinct genera, and not merely the well-known *Xyleborus*. On p. 121 two Horns, the American and the German, are confounded

as one: it was on the Cicindelidae, not the Carabidae, that Dr. Walther Horn's work was done. And who was Stettiner who worked on the Coccinellidae? In the pages devoted to the Orthoptera, we notice the old story of the aquatic habits of the Phasmid *Prisopus*; and some quaint remarks of the following kind: "The Mantid has a habit of staring. . . . It is the only insect which appears to see man as an individual." "The sense of hearing is particularly well developed in this family. . . . The exact function of the auditory organs is not known." "It is very unfortunate that the locusts should not form part of the family *Locustidae*." It certainly is unfortunate that economic entomologists should object to the law of priority, and persist in retaining family names which have been discarded by all the chief systematic workers. The locusts, as a matter of fact, form part of the family *Locustidae*.

The value of this manual to the student of economic entomology would be enhanced by the addition of a plant or subject index: and we would suggest that it is not altogether wise to encourage a belief that a family is of no economic importance in a case where nothing whatever is known of the habits or life-history of a single member of the family.

C. J. G.

Insecticides, Fungicides and Appliances. By O. G. ANDERSON and F. C. ROTH. Pp. xvi + 349. 71 figs. New York: John Wiley & Sons. London: Chapman & Hall. 15s. net.

THERE is much to commend in this book. Written primarily for the use of students who are specialising in plant pathology, it should prove of equal value as a work of reference on the subject with which it deals. It bears the stamp of being written by men who are thoroughly cognisant of their subject. The book is divided into two main sections. The first part is intended as a laboratory manual to instruct the student how to make up his sprays, and also to enable him to gain a knowledge of the apparatus with which to apply them. It gives the recognised standard formulae of insecticides and fungicides, directions for making them up, and explains how, when and to what they should be applied. By this means a student who has had no previous training in chemistry may become acquainted with those chemicals which are in daily use in field practice, either concurrently with or subsequently to his training in botany and entomology. In the hands of a capable instructor these exercises might be made the basis for imparting to students, in the absence of a separate course in the curriculum, a deeper knowledge of chemistry, without which no training of a plant pathologist would be, in this country at least, considered complete. We are glad to see that the authors have added some exercises dealing with problems of cost. This aspect is one which, judging from published remedial methods, is being constantly overlooked, and if in England we are to make any advance in the control of plant diseases, we must convince both the farmer and fruit grower that it pays to spray, and we must obtain the best results by the cheapest means. The second part of this book is introduced by two chapters on the control of insects by Professor J. J. Davis, and the control of plant diseases by Dr. M. W. Gardner, while the remainder is devoted to a consideration of spraying machinery and

accessories. These are dealt with in great detail, and illustrated by a wealth of photographs and sectional diagrams. The subject is treated from a severely practical point of view, each type being described, the purpose for which it is intended and the advantages and disadvantages discussed. Altogether the book is far in advance of anything we have in England; it shows that in the United States plant pathology is rapidly getting beyond that stage illustrated by surgery before the time of Pasteur and Lister, and for this reason alone it ought to be perused by all who are interested in the subject.

SOCIETIES.

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held on Saturday, June 9th, 1923, at "Hodeslea," Eastbourne, where the following members and friends assembled for an early lunch, viz. Robert Adkin in the Chair, Horace Donisthorpe, Malcolm Burr, J. E. Collin, H. Willoughby-Ellis, Ernest E. Green, A. E. Tonge and K. G. Blair. The afternoon was spent in a ramble on the Downs near Beachy Head, after which the party returned to "Hodeslea," where the club supper was held at 6.30. Mr. Willoughby-Ellis was elected a Member of the Club; he also accepted the office of Hon. Secretary in place of Mr. Richard South, retired. Some of the party who stayed over the week-end spent a morning in Abbot's Wood, and although dull weather prevailed practically throughout the meeting it was understood that some few more or less interesting captures fell to the lot of more assiduous workers.—H. WILLOUGHBY-ELLIS, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*March 22nd.*—Mr. N. D. Riley, F.Z.S., F.E.S., President, in the Chair.—Mr. Walter Burch, 35, Andell Rd., S.E. 14, was elected a member.—Mr. A. A. W. Buckstone exhibited ab. *nigronotata* of *Pieris brassicae* from Eltham, an unusually light example of *Anticlea nigrofasciaria* with a transverse banded form of the same species from Malvern, and an aberration of *Melitaea aurinia* from near Brighton having a broad black hind marginal band, the usual marginal spots being absent. Col. R. H. Rattray read a paper on "Indian Cuckoos."

April 12th.—The President in the Chair.—Mr. P. H. Windser, "Fern Hill," Horley, was elected a member.—Mr. E. H. Ellis read a paper with lantern slides, "The Life-History and Structure of Mosses."

April 26th.—The President in the Chair.—Messrs. W. G. Nash, "Clavering House," Bedford, and W. S. Brocklehurst, "Grove House," Bedford, were elected members.—Mr. K. G. Blair exhibited the stick-insects *Bacillus rossii* and *B. galliens* to compare with *Carausius* (*Diæippus*) *morosus* and gave the distinguishing characters of the two genera: the former genus has species with short antennae, in *Carausius* they are long; Mr. Newman, extreme forms of *Melitaea cinxia*, two undersides with black bands, two with a paucity of markings, and two uppersides with the outer two-thirds of the wings devoid of markings; Mr. H. Moore, Coleoptera from N. Zealand, including the Longicorn *Prionoplus reticularis*, whose huge larva lives on the Kauri-pine.

May 10th.—The President in the Chair.—Capt. Kenneth J.

Hayward, F.E.S., 492, High Rd., Chiswick, was elected a member. Mr. Tonge exhibited ova of *Eucosmia certala* laid on barberry in gardens at Reigate; Mr. A. W. Dennis, flowers of the Bogbean, *Menyanthes trifoliata*.—Mr. H. J. Prior gave a lecture, "The life of the Bee," with a series of lantern-slides in illustration.

May 24th.—Mr. K. G. Blair, B.Sc., Vice-President, in the Chair.—Messrs. G. A. W. Stolye, and R. W. Stolye, of Forest Hill, J. F. Johnstone and C. H. Cork, of Rayleigh, Essex, and F. A. Parker, of Cricklewood, were elected members.—Mr. Parker exhibited a strikingly aberrant form of *Brenthis euphrosyne* taken near Portsmouth, and a female *Euchloa cardaminis* with streaks of male orange coloration; Mr. Enefer, a sample of biscuits with larvae and imagines of the beetle *Phyllobius argentatus*, and a sample of lentils from Egypt infested with *Bruchus pisi*; Mr. Mera, a series of *Venilia macularia* which had been two years in pupa; Mr. Blair, empty galls of the Cecidomyiid, *Myroceris ovalis*, on a bark-encrusting fungus.—Mr. R. Adkin read a paper, "Some Ancient Naturalists and their Work."—HY. J. TURNER, Hon. Report Secretary.

LONDON NATURAL HISTORY SOCIETY.—March 20th.—Mr. E. B. Bishop, President, in the Chair.—Dr. M. Greenwood read a paper dealing with the medico-entomological researches of the late A. W. Bacot, who for many years had been a prominent member of the Society, and who had given his life in the cause of preventive medicine.

April 17th.—Mr. Bishop in the Chair.—Among the entomological exhibits were series of *Vanessa io*, and *Aglais urticae* showing aberrations and variations. Series of *Polygonia c-album* and *Pyrameis atalanta*, also *Aglais milberti* shown by Mr. H. B. Williams together with drawings and photographs to illustrate his paper.—Dr. Cockayne exhibited *Aglais kashmirensis*, *Vanessa canace*, *Eugonia c-aureum*, *Grapta interrogationis*, *Pyrameis dejeani*, *P. indica*, and larvae of *Eupithecia tenuitata*.—Mr. Collenette showed Vanessids from Java, including *P. cardui* and *P. dejeani*.—Mr. Pethen exhibited the pupa of the British Glow-worm, and specimens of the South European firefly, *Luciola hispanica*.—Mr. Burkill an Eriophyid gall on the flowers of *Cardamine pratensis* from Kent.—Mr. Harold S. Williams read a paper entitled "Preliminary Observations on the British Vanessids." Following a few general observations on the British species and their distribution the paper dealt with two subjects in detail—the method of pupation and the parallel and convergent variation of *Aglais urticae* and *Vanessa io*. Dealing with the first subject the lecturer referred to the errors of Reaumur and Buckler, and drew attention to the careful work of Osborne, Edwards, and the late Dr. Chapman, by which the method of suspension of the insect during the critical moments of pupation was solved. It appears that no satisfactory explanation of the method by which the newly-excluded pupa, after withdrawing its tail from the larval skin, rises to the pad of silk to which it is finally attached, in apparent defiance of the laws of gravitation, has yet been forthcoming. The second portion of the paper dealt with the markings of the two species referred to in detail, and with the relationship of such forms as *V. io*, ab. *ioformis*, Rss., and it was suggested that the facts pointed to the probability of *V. io* having developed from a species with a "tortoiseshell" facies, with some resemblance to *A. urticae*.—H. J. BURKILL, Minutes Secretary.

1742

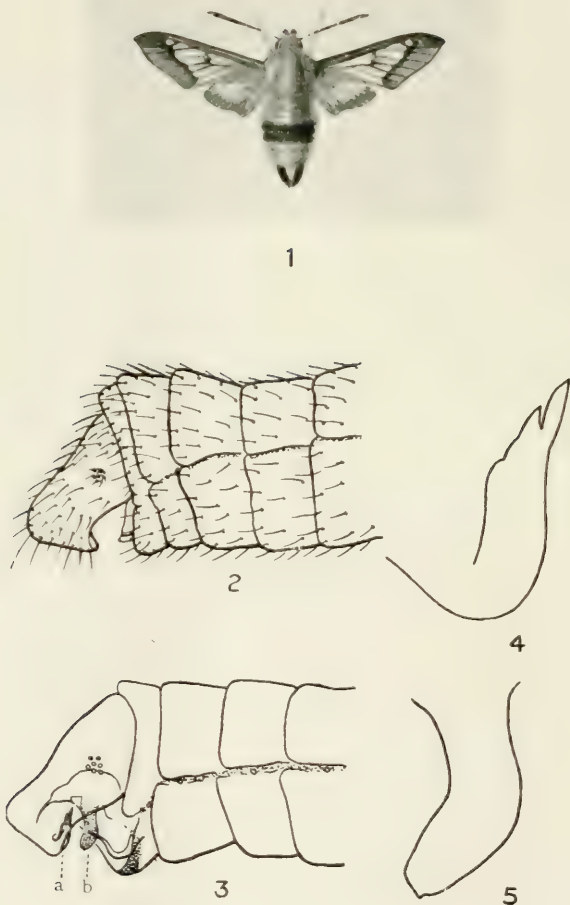


FIG. 1.—*Hemaris fuciformis*, aberration.

FIG. 2. Apex of abdomen of *Boriomyia rara* sp.n. ♂ holotype (x 28), in dry condition.

FIG. 3.—Same as 2 but drawn from balsam preparation.

a Apex of right paraproct.

b Right internal lobe (? penuncus).

FIG. 4.—Apex of left paraproct (x 150).

FIG. 5.—Left internal lobe (? penuncus) (x 150).

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HEMARIS FUCIFORMIS ABERRATION.

By F. W. FROHAWK, F.E.S., M.B.O.U.

(With Plate 3, fig. 1.)

THE accompanying figure (Plate 3, fig. 1) represents an aberration of *Hemaris fuciformis* so remarkable that it might be classed as a distinct species. In fact it is so abnormal as apparently to render it generically distinct. Upon comparing it with a normal specimen of *fuciformis* the great difference is most striking. As will be seen, the entire insect differs in all respects, not only in the formation of the wings and pattern of the markings, but also in the very different arrangement of the venation. The discoidal cell extends to centre of the fore wing instead of to the basal third as in the normal example. The marginal bands of both fore and hind wings are broader and very different in form in the fore wing, having the inner margin convex instead of concave, while at the costal angle is a conspicuous white spot; the colour of the band is much paler, being suffused with greyish, and the band of the hind wing is pale reddish. The wings are slightly dusted with scales, especially the veins. The abdominal band is rather broader and the antennae are more slender than in normal *fuciformis*.

This very interesting specimen was bred from a larva found feeding upon honeysuckle at Horsley, Surrey, in 1918 by Mr. T. L. Barnett, to whom I am indebted for the loan of the insect for figuring. He also found another larva at the same time which produced a normal example of this species.

DESCRIPTION OF A NEW SPECIES OF THE GENUS
CHRYSOPSYCHE (*LASIOCAMPIDAE*).

By W. H. T. TAMS.

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Chrysopsyche lutulenta sp. n.

♀. Antennae strongly pectinated; pectinations testaceous, shaft with buff scales; head and palpi deep buff mixed with yellow; thorax orange-ochraceous mixed with yellow and vinaceous-buff; abdomen orange-ochraceous mixed with yellow; pectus, legs and underside of abdomen bright orange-ochraceous mixed with yellow. Fore wing pale chrome yellow, the costa edged with deep buff; a large dark-clay-coloured patch filling the base of the wing to nearly one-third, its outer edge deeply curved (concavity basad); at the end of the cell touching the upper and lower angles a bright orange, almost circular spot with pale chrome-yellow centre, the orange outwardly gradually shading off into the ground-colour; below the orange spot, and slightly basad, a small dark-clay-coloured isosceles triangle, one side lying along the lower edge of the cell, the apex pointing to the apex of the wing; a broad, dark-clay-coloured postmedial fascia, slightly curved (convexity terminad), its outer edge at the costa distant about 7 or 8 mm. from the apex of the wing, but the lower half merging with the subterminal fascia; the subterminal fascia narrow, broken, consisting of a small triangular dark-clay-coloured spot near the apex, between veins R3 and R4; a larger one between veins R4 and R5, slightly nearer the postmedial fascia; a still larger, more irregular spot between veins R5 and M1, nearer to the postmedial fascia than the preceding spot, and, like it, sometimes mixed with deep orange-yellow; the remainder of the subterminal fascia is merged with the postmedial, evidence however remaining of two spots, larger than the three previously described, one between veins M1 and M2, and the second, much larger and freely mixed with deep orange-yellow, between veins M3 and Cu1. Hind wing bright orange-yellow, pale chrome-yellow above vein M1, the pale colour sometimes extending further down the wing at the termen; a narrow, short, dark-clay-coloured fascia from the middle of the costa to vein M1, and another nearer the apex, sometimes extending below vein M1 to vein M2. Underside: Fore wing pale chrome-yellow deepening to orange-yellow at the end of the cell and at the subterminal fascia; hind wing pale chrome-yellow deepening to orange-yellow below vein M1, and with traces of markings corresponding with the two narrow fasciae on the upper side. Expanse 62 mm.

Holotype ♀ Mpuapua, German East Africa (Dr. Baxter), in the Tring Museum. *Paratype* ♀ Zanzibar (Smith), in coll. Joicey (ex coll. Druce). *Paratype* ♀ Kenya Colony, in the collection of the Division of Entomology of Kenya Colony.

I am indebted to Lord Rothschild and to Mr. J. J. Joicey for the opportunity of examining and describing this species, the three specimens of which come from different sources.

B.M. (N.H.), S. Kensington.

PERONEA HASTIANA, L. : ITS DISTRIBUTION, HABITS,
LIFE-CYCLE AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 178.)

(23) ab. **transversana** n. ab. (Plate 2, fig. 5.)

Synonymy.—Kennel, Pal. Tort. pl. iii, figs. 21 and 22 (1908) (*hastiana*).

This aberration resembles the last in every respect except that the ground-colour of the superiors is dark reddish brown. The margins of the transverse band are black. I have examples of it from Morpeth, including the type, Lancashire, Lochinver, Wimbledon, Rannoch, and Invershin. Although by no means common, I have not found it rare.

(24) ab. **plumbeana** n. ab. (Plate 2, fig. 13.)

This aberration has the ground-colour of the superiors, head and thorax of a uniform dark plumbeous grey colour, with the borders to the transverse band black; the general appearance can best be judged by consulting the figure. It is not especially rare, but by no means common. I have examples from Wicken, Lancashire, Invershin and Lochinver; my type comes from Lochinver.

Albisparsana Group.

Two remarkable forms with the plain dark ground-colour of the superiors thickly sprinkled with white scales.

(25) ab. **albisparsana** n. ab.

In this aberration the ground-colour of the superiors is of a uniform dark grey colour, without trace of the transverse strigae; the whole surface is thickly sprinkled with white scales.

The form is not uncommon. I have examples, including the type, from Kent, Wicken, and Lancashire.

(26) ab. **irrorana** n. ab.

Similar in all respects to the last except that the ground-colour of the superiors is reddish brown.

Ab. *irrorana* is also not an uncommon form, especially in the north; I have many fine examples, including the type, from Lochinver, and from Soyea, and Lancashire.

Aquilana Group.

Forms with uniformly brown, fuscous, or black superiors.

(27) ab. *aquilana*, Hüb.

Synonymy.—Hübner, Tort. fig. 235 (1818); Id., Verz. p. 384. No. 3718 (1826); Frölich, Tort. Wurt. p. 22 (1826); Treitschke, Schmett. von Eur. viii. p. 252 (1830); Heinemann, Schmett. Deutsch. i. p. 15 (1865); Staudinger, Cat. Lep. Eur. ii. No. 652¹¹ (1871); Snellen, Vlind. Ned. Micr. p. 177 (1882); Staudinger, Cat. Pal. Lep. ii. p. 80. No. 1446e (1901); Meyrick, Gen. Ins., fasc. 149. p. 64 (1913).

Hubner figured and named this aberration without describing it. The following is a description I have made from his figure: Head and thorax putty-coloured; superiors dark reddish brown, darkest at the base and the termen, and slightly paler on the disc; a small discoidal spot is indicated. The inferiors are fuscous, darker around the outer margin.

Ab. *aquilana* is a common form in certain parts of Britain, but I have not found it in all. I have examples from Lancashire, Rannoch, and Lochinver only: it is evidently a northern form in our country. I have bred it most freely from Lochinver larvae.

(28) ab. *flavicapitana* n. ab.

This aberration is similar to the last in all respects except that the colour of the superiors is black: that is to say it is a melanic form of ab. *aquilana*.

Most of my examples came from Lancashire, but I have others, including the type, from Rannoch, and one from the Isle of Wight.

Kennel (Pal. Tort., pl. iii. fig. 41) figures a form of *hastiana* similar to ab. *flavicapitana*, which he calls ab. *opacana* Hüb. (fig. 334). Staudinger, however (Cat. Pal. Lep., ii. p. 81. no. 1448b), considers *opacana* to be a form of *abietana* Hüb. I see no reason to doubt this.

(29) ab. *nigrana* n. ab.

A form similar to the last but the head and thorax are black in lieu of being putty-coloured.

Apparently at present this form is rare, but as time goes on, with the increase of melanism, which usually takes place when a species develops this form of variation, it may be expected to become more common. My type-specimen came from Lancashire; I have the form also from Invershin.

(30) ab. *brunneana* n. ab.

Synonymy.—Westwood, Brit. Moths, ii, pl. xcv, fig. 11 (1845) (*obsoletana*); Kennel, Pal. Tort. pl. iii, fig. 40, and p. 72 (1908) (*autumnana*).

In this aberration the whole of the superiors, the head and thorax, are of a uniform reddish-brown colour. It is in all respects similar to ab. *aquilana*, except that it lacks the putty coloured head and thorax.

A very abundant form, in many districts taking the place of ab. *aquilana*. My type came from Kent; I have other examples from Lancashire, Wicken, Morpeth, Lochinver and Rannoch.

(31) ab. *pruinosa* Staud.

Synonymy.—Staudinger, Cat. Lep. Pal. ii, p. 80, No. 1446*d* (1901); Barrett, Brit. Lep. pl. ccccliii, fig. 1*e* (1905); Kennel, Pal. Tort. pl. iii, figs. 38 and 39 and p. 72 (1908); Meyrick, Gen. Ins., fasc. 149, p. 65 (1913).

Original description.—Minor al. ant. unicoloribus fuscis (Staudinger, *l.c.*).

Specimens agreeing with Staudinger's description are not uncommon in Britain; I have them from Kent, Wicken, Lancashire and Rannoch.

Division II.

Forms with the markings of the superiors consisting solely, or mainly, of longitudinal striations. In a certain number of the aberrations in this division the transverse markings, so prominent in the majority of the forms in Division I, are indicated more or less distinctly in addition to the longitudinal striations.

Psorana Group.

Forms with longitudinal branched black markings extending from the centre of the base of the superiors to beyond the disc.

(32) ab. *psorana* Fröl.

Synonymy.—Frölich, Tort. Wurt. p. 20 (1828); Westwood, Brit. Moths, vol. ii, pl. xcv, fig. 15, and p. 162 (1845) (*leachiana*); Staudinger, Cat. Lep. Eur. ii, No. 652*m* (1871); Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1446*c* (1901); Kennel, Pal. Tort. pl. iii, figs. 25, 35, 36, and 37, and p. 71 (1908); Spuler, Schmett. Eur. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Original description.—Alis anticis scabris griseo-cinereis, linea disci nigra a basi ad medium ducta, antice strigis 2 fuscis tuberculato-asperis.

Statura et magnitudo *T. niveane*. Alae anticae cinereae griseo subnebulosae, linea media longitudinali recta nigra notatae, praetereaue strigis 2 e punctis elevatis fusciscentibus scabrae, quarum altera pone basin, altera in medio longior subarcuata, postice punctis elevatis sparsis. Thorax griseus cristatus. Alae subtus cinereae (Frölich, *l.c.*).

Specimens agreeing with Frölich's description occur in Britain, but, so far as my knowledge goes, from southern localities only, and apparently they are very local in these regions. I have a series of fourteen examples from the Bond Collection labelled Wimbledon, and the form was also bred in 1922 by Messrs. Metcalfe & Morgan from Devonshire larvae.

(33) ab. *leucophaeana* Westwd.

Synonymy.—Westwood, Brit. Moths, vol. ii. pl. xciv, fig. 7, and p. 158 (1845); Tengstrom, Bidrag, p. 93 (1847).

Original description.—Measures eleven lines in expanse; forewings of a leaden-coloured brown, with a black streak, dilated at the base, extending from the base to the middle of the disc of the wing, where is also another short black dash, the adjoining space being of a reddish tinge; hind wings pale silvery brown; head and thorax liver-brown. Taken in Nottinghamshire by Mr. Desvignes (but very rare) (Westwood, *l.c.*).

The difference between this and the last is that the tint of the ground-colour in ab. *leucophaeana* is as described by Westwood, and shown by his figure, "leaden coloured brown," whilst in ab. *psorana* it is "light ashy grey."

Westwood says—"figured from specimens in Mr. Bentley's Collection." Ab. *leucophaeana* is by no means an abundant form, and is apparently local. I have examples from Wimbledon, Wicken, and Lancashire.

Albistriana Group.

Forms with a vitta, white with darker scales, arranged in a longitudinal striation, extending along the whole length of the inner margins of the superiors.

(34) ab. *albistriana* Haw.

Synonymy.—Haworth, Lep. Brit. p. 412, No. 59 (1811); Stephens, Cat. ii, p. 186, No. 7065 (1829); Curtis, Guide, 1st edn., p. 173 (1829); Rennie, Conspect. p. 177 (1832); Stephens, Haust. iv, p. 155 (1834); Curtis, Brit. Ent. 2nd edn., 16, No. 26 (post 1834); Id., Guide, 2nd edn., p. 202 (1837); Wood, Index Ent. No. 1069 (1839); Westwood, Brit. Moths, vol. ii, p. 157 (1845); Staudinger, Cat. Lep. Eur. ii, No. 652p (1871); Snellen, Vlind. Ned. Micr. p. 177

(1882); Staudinger, Cat. Pal. Lep. ii, p. 80 No. 1446*m* (1901); Spuler, Schmett. Eur. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Original description.—T [the grey streak] alis fuscis, costa scabro-ciliata, striaque cinerea tenuioris. Habitat in Anglia rarissime. Expansio alarum 10 lin. Descriptio: Alae anticae fuscae tinctura obsoletissima purpurascente punctis paucis scabriusculis, posticae pallide fusciscentes (Haworth, *l.c.*).

Ab. *albistriana*, although by no means one of the most abundant forms of *hastiana*, is not rare. I have it from Wimbledon, Kent, and the Isle of Wight, and it is abundant and remarkably fine at Lochinver, and in the adjacent Island of Soyea.

(35) ab. **brunneostriana** n. ab.

Synonymy.—Stephens, Haust. iv, p. 155 (1834) (*albistriana*); Kennel, Pal. Tort. pl. iii, fig. 43, and p. 72 (1908) (*albistriana*).

The distinction between this and the last aberration is that the ground-colour of the superiors is light reddish brown, whereas in ab. *albistriana* it is, as described by Haworth, fuscous, *i. e.* dusky.

Ab. *brunneostriana* is not uncommon. I have examples, including the type, from Wimbledon, *ex* Bond Collection, the Isle of Wight, and Lochinver.

(36) ab. **nigrostriana** n. ab. (Plate 2, fig. 8.)

I give this name to an aberration similar in all respects to the last, except that it has in addition the double longitudinal black lines occurring in abs. *psorana* Fröl. and *leucophaeana* Westwd.

The form, which is a very striking one, is, apparently, although recurrent, very rare. I have one example, the type, from the Bond Collection, Wimbledon. One was bred last year by Mr. E. D. Morgan from a Devonshire larva, and I have seen one or two others in collections.

(37) ab. **griseofasciana** n. ab.

The ground-colour of the superiors is reddish brown; it has a vitta on the inner margin similar to the last three aberrations, and in addition a distinct white transverse striga or band, with shaded reddish-brown scales.

So far as I am aware ab. *griseofasciana* is confined to the north-west of Scotland. I have two examples, including the type, from Invershin, and six others from Lochinver.

(38) ab. **ochreofasciana** n. ab. (Plate 2, fig. 14.)

This aberration is similar to the last in all respects except that the transverse strigae are ochreous brown. It is practically iden-

tical with ab. *bollingerana* Hüb., with the addition of the pale vitta along the internal margins of the superiors.

Of my examples of this form, including the type, nine are from Lochinver and Soyea. I have one, however, from Kent, and a very fine one from Wimbledon.

(To be continued.)

A NEW BRITISH HEMEROBIID (ORDER NEUROPTERA).

By C. L. WITHERCOMBE, M.Sc., Ph.D.

(Plate 3, part).

On the 16th August, 1922, a peculiar Hemerobiid was taken upon Scotch fir (*Pinus sylvestris* L.) at Oxshott, Surrey, which superficially appeared as a pale and slightly yellowish *Boriomyia subnebulosa* Steph. More careful examination of the genitalia showed this to be the male of a new species of *Boriomyia*. Not wishing to describe a new species from a single specimen I awaited the acquisition of further material. Having since captured in all 2 ♂♂ and 2 ♀♀, and also having seen the larva, it would now appear desirable to give a description of this insect.

Boriomyia rava sp. n.

Description of ♂.—General colour pale brownish-grey. Very similar to a pale example of *Boriomyia subnebulosa* Steph. *Head* with face shining fuscous. Palpi fuscous. Vertex whitish. Eyes globose, black. Antennae moniliform, 64-jointed; each joint obscurely ringed with fuscous. The large basal joint is pale fuscous. *Thorax* with a broad whitish dorsal vitta, and within this a fine, impressed, dark median line. Latero-dorsally the thorax is dark brown. Laterally and ventrally the colour is whitish or brownish-white. *Abdomen* uniformly brownish-white, with no vitta dorsally. The entire insect is, as usual, covered with hairs more or less thickly. Genitalia characteristic. In the dry state the paraprocts (lateral valves) alone are seen. These are band-like, parallel-sided, and distally appearing squarely truncate (fig. 1). Actually the terminal appendages are bent under internally and are hidden from view. In a balsam preparation it is seen that the terminal portion is short and tapering, with three, more or less distinct, teeth internally (figs. 2 and 3). The paired, internal, chitinous lobes (? penunci) are each flat, and bent obtusely about the middle (fig. 4). Their apices are bluntly rounded. The sub-genital plate is short, but is pigmented slightly darker fuscous. Legs pale fuscous, tarsi darker, but more especially so apically. *Wings* similar to those of a pale *B. subnebulosa* Steph. In the forewing, in the region of the fork of Cu₁, there is little dark mottling such as is generally found in *subnebulosa* Steph.

and *nervosa* Fab. Seven (left) to eight (right) cross-veins in outer gradate series of fore wings. Six (right) to seven (left) cross-veins in inner series. The veins are dotted with fuscous, being thus mottled whitish and fuscous, but the gradate cross-veins are almost entirely of uniform dark fuscous colour. Hindwings with venation wholly pale. No basal cross-vein between R_1 and R_s .

Length of body 6 mm.; anterior wing 7.5 mm.; posterior wing 6.5 mm.

Habitat.—On *Pinus sylvestris* L., Oxshott, Surrey, 5th May, 1923. Taken by myself.

Holotype ♂ in British Museum (Nat. Hist.). One paratype ♂ in my collection, taken in the same locality, 16th August, 1922.

Description of ♀.—In general colour and appearance similar to the ♂. The forewing venation is fairly uniformly mottled with fuscous and whitish, and from the fuscous spots on the veins faint sagittate markings extend into the membrane. These markings are more noticeable than in the ♂. Most cross-veins are of uniform fuscous colour, and there is some fuscous clouding of the membrane in the region of gradate cross-veins. Seven cross-veins in outer gradate series, six in inner series, in both pairs of wings. Hind wings with venation wholly pale; basal cross-vein from R_1 to R_s absent. Body coloration and structure in general much like that of the ♂, though slightly darker. Antennae 68-jointed; the joints pale, but annulated with fuscous. Genitalia with paraprocts very similar to those of a female *subnebulosa*. Ventral valves also similar, but more square and less rounded than in *subnebulosa*.

Length of body 6 mm.; anterior wing 7.5 mm.; posterior wing 6.5 mm.

Habitat.—Bred from a larva found hibernating under bark of *Pinus sylvestris* L., at Oxshott, Surrey, on 7th December, 1922. Taken by myself.

Allotype ♀ in British Museum (Nat. Hist.). One paratype ♀ in my collection, taken in same locality 10th September, 1921.

This species may easily be confused with *Boriomyia subnebulosa* Steph., and possibly specimens already exist in collections under that name, but *B. rava* appears to be always of a pale colour, and to lack the dark mottling of vein Cu_1 , so often found in *B. subnebulosa* Steph. and *nervosa* Fab. The holotype ♂ was kept alive for a week and the allotype ♀ for ten days, feeding upon aphids. Under such conditions any Hemerobiid in captivity would assume its final and mature coloration, so that I think that there is no doubt as to the descriptions applying to fully mature forms. Venational distinctions are not always reliable, as is commonly the case in Hemerobiidae, but it is interesting that the absence of the basal cross-vein in the hind wing from R_1 to R_s appears to be the rule in this species, whereas in *B. subnebulosa* this cross-vein is more

generally present. (The ♂ paratype, however, possesses the basal cross-vein in the left hind wing, but not in the right.) In the case of the ♂ there can be no difficulty of identification, since the genitalia are so very characteristic, although difficult to examine without making a balsam preparation. In a dry specimen the paraprocts most nearly resemble those of *B. subnebulosa* Steph. in their square distal portions, but the termination of the appendage is quite different. From *mortoni* McL.—for a specimen of which I am indebted to Mr. K. J. Morton—the genitalia differ in the termination of the appendages, and also in the absence of the closely-set yellowish hairs dorsally on the apical segments of the abdomen.

The life-history of *B. rara* is probably similar (except hibernation) to that of *B. subnebulosa* Steph., which has already been described (Withycombe, Trans. Ent. Soc., 1922, pp. 540–542). I am unable to distinguish the larva from that of *subnebulosa*, except in that it is of a very pale greyish-brown colour and scarcely marked. There are probably several broods in the year, as imagines have been taken in May, August and September. Winter is passed as a free, full-fed larva and not within a cocoon. Thus the species differs from all other British Hemerobiidae that I have seen, with the exception of *Symphorobius* (*Eurobius*) *pygmaeus* Ramb. The allotype ♀ was bred from a larva which was found hibernating under the bark of a pine tree on the 7th December, 1922. It remained without feeding until April, 1923, when an elongate-oval cocoon of white silk was spun. This was not in any way different from the cocoon of *B. subnebulosa* Steph. The imago appeared on the 9th May, 1923. Thus *B. rara* differs from *B. subnebulosa* not only in structure, but also in its life-history.

It is to be expected that this species will be found to be more wide-spread now that its distinguishing characters have been pointed out. Confirmation of the hibernation of the larva is needed, as this is unusual.

NOTES ON THE BUTTERFLIES OF THE BANKS COLLECTION.

By H. T. G. WATKINS.

THE collection of insects made by Mr. (afterwards Sir) Joseph Banks (1743–1820), which came to the British Museum through the Linnean Society in 1863, contains 715 butterflies of 462 species and still includes 103 Fabrician types, a further 5 at least having been in the collection when described.

Fabricius records in his autobiography, of which a trans-

lation by Hope appears in the Transactions of the Entomological Society, vol. 4 (1845), that he inspected this collection among others periodically during seven visits to England from 1772 to 1791, and a large number of specimens bear labels in his writing. For this reason, as well as from the intrinsic and historical interest of many specimens obtained on Captain Cook's famous voyage in the "Endeavour" (1768-71), on which Banks went as naturalist, and the two subsequent voyages in the "Resolution" to the Pacific (1772-9), some notes on a recent rearrangement and study of the collection may be of interest.

From Eastern Australia ("New Holland") there are the types of 27 species or subspecies: *Danaida affinis*, *Tellervo zoilus*, *Acræa andromacha*, *Cethosia cydippe chrysippe*, *Cupha prosope*, *Precis hedonia zelima*, *Hypolimnas bolina nerina*, *Melanitis leda bankia*, *Ypthima arctous*, *Hypocysta irius*, *Mycalesis (Calysisme) perseus*, *M. sirius*, *M. terminus*, *Heteronympha merope*, *Lampides boeticus damoetes*, *Candalides erinus*, *Hypochrysops apelles*, *H. narcissus*, *Belenois java teutonia*, *Delias nysa*, *D. mysis*, *D. nigrina*, *Appias melania* (= *asteria*, Miskin), *Catopsilia pomona*, *Eurycyus cressida* (and *harmonia* = *cressida* ♀), *Trapezites iacchus*. As there had been no previous scientific voyage to New Holland and there was no subsequent return from one prior to the publication of the *Systema* in 1775, it may be assumed that all these types were obtained during the voyage of the "Endeavour," and nearly all, as the specimens show, during the enforced sojourn at the future Cooktown in North Queensland in June to August, 1770. There are also specimens, not the types, of nine other Australian species not described from this collection: *Euploea corinna*, MacLeay, *E. hyems niveata*, Butler, *Danaida chrysippus petilia*, Stoll, *Hypolimnas alimena lamina*, Fruhst., *Zizera labradus*, Godt., *Hypolycaena phorbas*, Fab., *Delias argenthona*, Fab., *Appias paulina* ega, Bdv., *Hesperilla donnysa*, Hew. A further type, that of *Amblypodia (Archopala) centaurus*, though described as from "New Holland," is certainly non-Australian. As pointed out by Butler (Cat. Lep. Fab. B.M., p. 179), it belongs to the race *nakula*, Felder, and is probably from Malacca.

From New Zealand (October, 1769, to March, 1770) there are the types of *Pyrameis gonerilla* and *P. itea*, and a pair of *Heodes salustius*, which was described by Fabricius, but not from this collection. From the Tonga Group (August, 1769) the types of *Precis villida* ("Amsterdam I." = Tongatabu) and *Doleschallia bisaltide drusus* ("Rotterdam I." = Namuka). From Tahiti (April to July, 1769) the type of *Melanitis leda solandra* and two pairs of *Hypolimnas bolina otaheitae*, Felder. From Hawaii a single ♂ of *Pyrameis tannmeamea*, Esch., and from the W. coast of N. America a pair of *Polygonia satyrus*, Edw., all three probably obtained by the "Resolution," in

which, Banks having a difference of opinion with the Admiralty, the two Forsters had sailed in his place.

The five types now missing from the collection are (*Acraea*) *caecilia*, a ♀ from Sierra Leone with white band; (*Hamanumida*) *daedalus*, a ♂ d.s.f. from W. Africa, having a pale brown underside, not red-brown as in the subsequently described f. *melantha*, of which the type survives; (*Anteros*) *croesus* from Surinam, for which Fabricius, finding a prior *Papilio croesus* existed, gave the revised name *valens*, but both sink to *formosus*, Cram.; (*Huphina*) *licca* ♂, for which see below; and (*Oeneis*) *melissa* from Newfoundland. This last was described first in the *Systema*, and it seems probable that at one time there were two quite unconnected *melissa* types, as the name appears in F.'s writing on a specimen of *Euthalia kesava* ♂, and in the *Species Insectorum* of 1781 there is a reference after the description of the *Oeneis* to Cramer's figure of *Euthalia aconthea*. This, however, is omitted in the *Entomologia Systematica* of 1793.

The type of *Smyrna blomfieldia* from Brazil, though referred to in F.'s later work, the *Ent. Syst.*, as being in the Banks Collection, was described by him from Blomfield's Collection, and may never have belonged to Banks at all, especially as the latter had F.'s type of *proserpina*, which is identical. *Neonympha eurytris*, described in the same work from Jamaica, is presumably only a mis-spelling of *eurytus*, already described as in the Hunter Collection; no specimen is now in the Banks Collection.

Some notes follow on individual types still in the collection:

Cethosia cydippe chrysippe.—The type, a ♀ described as from "New Holland," has so narrow a white band that in this respect it resembles the New Guinea races *præstabilis*, Fruhst., and *damasippe*, Felder, but the underside is decidedly Australian. In three New Guinea ♀s from a single locality the band varies much in breadth.

Cynthia erota.—The type is a ♀ described from "Africa" which on a careful comparison with the series in the B.M. agrees best with Siamese specimens. The same applies to **Parthenos gambrisius**, described from "India orientalis."

Pyrameis itea.—The type of this common Australian species is, as has been said, from New Zealand.

Precis villida.—The types are undoubtedly from Tonga ("Amsterdam I," now known as Tongatabu). The Australian race, larger, with greyish or pale-ochreous, not tawny-marked, underside h.w., appears to be *calybe*, Godart.

Doleschallia bisaltide drusus.—This race from Tonga, apparently the most easterly known of this wide-ranging species, is distinguished, in the types at any rate, by the partial disappearance of the black edging above, so that the black bar from the costa of f.w. is disconnected from the terminal and apical

border; on the h.w. the dusky border is very narrow (2 mm.), and the black postdiscal spots in areas 2, 5 and 6 stand out clearly from the ground-colour. Underside deep rust-brown, the transverse lines and white markings of both wings distinct. ♂ 2 from "Rotterdam I." (Namuka). A ♂ from Fiji in the Adams Collection has a similar underside, but above the black border is normal, though the h.w. spots are sharply defined.

Catagramma astarte codomannus.—A ♂, most nearly resembling specimens from the Madeira River and from Matto Grosso in S.C. Brazil. It formed one of a small collection which had been pressed like dried flowers, and included the types of *C. hystaspes* ♂ and *Smyrna proserpina* (= *blomfieldia*) ♂, also *Peridromia velutina* ♂ 2, *P. amphinome* ♂, *Adelpha mesenteria* ♂, *Victorina steneles* ♂, *Prepona omphale dives* ♂, and *Stalactis cassiope* ♂ ♀.

Curetis aesopus and **phaedrus**.—Following Dr. Chapman in *Novit. Zool.*, xxii, p. 89, I certainly think these types are a pair (♀ ♂) from the same place in India, but cannot follow his separation of them from *thetis* Drury, as a species, *phaedrus*. In any event the name *aesopus* is prior to *phaedrus*. I think both names are synonymous of *thetis*, and that C.'s second species should be known as *arcuata* Moore (types in B.M. from Malabar).

Bindahara phocides.—The locality of this type, a ♀, labelled as from "Africa aequinoctialis," must be uncertain until better series of the races of this rather widely ranging species are available. It seems to agree best with the Bornean form.

Leptosia (Nychitona) nina.—This was a revised name given by Fabricius to the Indian species which he had described in the Species Insectorum as *xiphia*, when he found that he had already, from this same collection, described another "*Papilio xiphia*," the *Pararge* from Madeira, in the Systema. The name *nina* and not *xiphia* should therefore be used for the Pierid.

Huphina judith and **licea**.—The name *licea*, which Fabricius subordinated to *judith* in the Ent. Syst., is prior to it in the Mantissa, and must be taken as the specific name, although the type is lost. Described as from "Africa aequinoctialis," it agrees with the Sumatran race (*selma*, Weymer), which has a narrower border h.w. and blacker apex f.w. than *judith* from Java.

Appias sylvia.—The type is a ♂ from Sierra Leone. There is also a ♀ which F. had placed with his type, also from Sierra Leone, of *Mylothris rhodope*, which it much resembles. Owing to the similarity the *Appias* has sometimes been wrongly known as *rhodope* and the *Mylothris* has passed as *spica*, Moeschler.

Colotis (Teracolus) rhexia.—Misplaced labels led Butler and other authors to take a specimen of *Irias pyrene* ♂ (the *sesia* of Fabricius) for the type of *rhexia*, which is fully described in the Systema and denotes 2 ♂ specimens of *Colotis erippe*, L.,

coming, as F. says, from Sierra Leone. It is probable that Linné in his original description of *evippe* (Syst. Nat., ed. 10, p. 469, no. 64, 1758) included the rather similar *Ixias marianne* and possibly also forms of *I. pyrene*, the latter being afterwards separated by him in Mus. Ulr., p. 241, 1764, and Syst. Nat., ed. 12, p. 762, no. 86, 1767. Drury, too, uses *evippe* for an *Ixias* in 1773. Hence probably Fabricius in 1775 labelled the *I. marianne* of the Banks Coll. as "*evippe*, L." and redescribed the W. African *Colotis* as *rheia*. This name must be considered as a synonym (σ) of the race *arethusa*, Drury (φ), from Sierra Leone, typical *evippe* being from Angola.

***Ixias pirithous*.**—The type is a φ of *pyrene pyrene*, L., and is certainly from S. China, though described as from "America borealis." The σ specimen, which was wrongly considered to be the type of *rheia*, is also S. Chinese. Another σ , placed with it by F. and bearing the label "*Sesia*," is S. Indian, probably Mysore.

***Actinote pyrrha*.**—The type is a φ from S. Brazil (probably Rio, Nov. Dec., 1768), and belongs to the species described by Dr. Jordan in "Seitz" as *carycina*. The allied species there called *pyrrha* should apparently be *morio*, Oberthür. Dr. Jordan concurs in this.

***Oeneis polixenes*.**—The type, described from "America borealis," is a σ , and agrees with Newfoundland specimens in the B.M. It belongs to the species, a form of which was subsequently described, probably from Hudson Bay or northern Labrador, as *subhyalina* Curtis, *vide* Elwes, who examined its type (in coll. Oberthür).

The ***melissa*** described by Fab. a few pages later than *polixenes*, and which had apparently a more dentate appearance (? more chequered fringes) and a more marbled underside, was probably the north-eastern race (= ? *oeno*, Bdv.) of *semidea*, but the type is now lost. Its description does not agree so well with *taygete*, Hb., the third similar species of that neighbourhood.

Though they are not types, being labelled "*palaeno*, L.," a pair of N. American *Colias* belonging to the species *pelidne*, Bdv., and having probably been taken, like the *O. polixenes*, on Banks' visit with Phipps to Newfoundland in 1766, are of considerable interest. They seem to be intermediate in size between the forms *laurentina*, Scudder, from Cape Breton I, and *labradorensis*, Scudder. Each has the central spot of the h.w. beneath rust-coloured only without a silver centre, rosy fringes and basal spot, and (for this species) a broad border above, hardly veined in the σ . Possibly they are from the northern part of Newfoundland, but they do not agree exactly with any of the *laurentina* from Newfoundland and South Labrador in the B.M., nor with any of a long series of *labrador-*

ensis from the east coast. It is tempting, but I fear unjustifiable, to suggest that the passage of 157 years may have produced some slight visible change in the unstable variable forms of *Colias* in North America.

The following is a list of the remainder of the types in the collection: *Acræa murcia* (♀ of *camoena*, Dr.), *A. quirina*, *A. encedon*, L., ♀ f. *lycia*, *A. bonasia*, *Planema gea*, *Heliconius erato phyllis*, *Precis pelarga*, *P. harpyia* (= *pelarga* ♀), *Hypolimnas bolina bolina*, L., ♀ f. *avia*, *Eunica maja*, *Neptis heliodore*, *Lebadea martha*, *Euphaedra eupalus*, *E. ceres*, *Euthalia* (*Cynitia*) *cocytus*, *Cyrestis camillus*, *C. cocles*, *C. periander*, *Nymphalis* (*Charaxes*) *marica* (♀ of *tiridates*, Fab.), *N. fabius*, *Faunis arcesilaus*, *Dynastor darius*, *Erebia mergus* (= *medusa*, Schiff.), *Euptychia hermes*, *Zemeros flegyas allica*, *Abisara gerontes*, *Neochrysops parsimon*, *Heodes hiere* ♂ ♀ (= *alciphron*, Rott.), *Iolaus helius* (= *eurisus*, Cr.), *Deudorix jarbus*, *Lycaenesthes moncus* (= *sylvanus*, Dr.), *Calycopis endymion*, *Tmolus cleon*, *Myrina silenus*, *Dapidodigma hymen*, *Marmessus lisias*, *Mylothris chloris*, *Appias saba* (= *epaphia*, Cr.), *Pareronia valeria hippia*, *P. valeria philomela*, *Nepheronia argia*, *Colias lesbia* ♂ ♀, *Catopsilia florella*, *C. argante*, *Ornithoptera heliacon* ♂ and *artenous* ♀ (= *helenia helenia*, L.), *Papilio* (*Araminta*) *zenobia*, *P. brutus* (= *dardanus dardanus*, Brown), *P.* (*Harimala*) *peranthus* ♂ ♀, *P.* (*Erioptera*) *doreus* (= *phorcas*, Cr.), *P.* (*Idaides*) *empedocles*, *Leptocircus curius*, *Jemadia gnetus*, *Tagiades fesus*, *Ceratrachia phocion*, *Cecropterus annus*.

Claims have been made for several of the specimens which belong to the Fabrician species and bear labels in his writing that they are his types, but unless the species is described by F. as being in the Banks Collection, these ascriptions seem to me quite unsafe. It may be that Banks, who outlived Drury and other contemporaries, acquired some types out of their collections, but at present there is no evidence. In conclusion, I wish to express my best thanks to Captain Riley for constant advice and help.

Brit. Mus. (Nat. Hist.),
S. Kensington.

STUDIES AMONG THE AMERICAN GALERUCIDÆ (COL.).

BY F. C. BOWDITCH.

(Continued from page 110.)

The Central and South American species of *Galerucella* have received scant attention and even at that they appear to be mixed up. *Gal. fusco-maculata* Jac., Proc. Zool. Soc., 1889, p. 291, is pre-occupied (used in Biologia) and should be changed to *jacobyi*

Bow. I fail to see the synonymy of *Gal. murina* Blanch. and *nigropicta* Boh. The figure of *murina* as given in the coloured plate in Voy. d'Orb. shows a very distinctly spotted form, $8\frac{1}{2}$ mm. long, from Bolivia (I have nothing like it): *nigropicta* is described from Monte Video and seems a common form, a great deal smaller and looking not at all like the Bolivian insect, but on the other hand *interrupta* Jac. seems to me to be *nigropicta* Boh.

***Galerucella peruviana* sp. nov.**

Medium sized, parallel: dull yellow, clothed with golden pubescence; eyes, apical part of antennal joints, 2 spots on the thorax, a sublateral (beginning on the shoulder) and two discal stripes, none attaining the apex and more or less interrupted, together with the knees and apex of the tibiae and tarsi, very dark brown.

Type: 2 examples, Marcapata, Peru. Length $5\frac{1}{2}$ mm. (Coll. Bow.).

Labrum and mouth piceous, clypeus smooth, polished, concave; head thickly punctate, longitudinally grooved: antennae reaching the middle of the elytra, 3 joint the longest: thorax thickly finely punctate, with both side and longitudinal depressions: rear edge sinuate at middle, sides rounded: scutellum punctate: elytra wider than the thorax, thickly finely punctate, with two fairly distinct raised costae in the middle of each elytron, scarcely attaining the base and obsolete before the apex: these costae parallel the brown stripes: apex of elytra sinuate, sutural apex with a short spine, claws bifid. I have not noticed any other form with a smooth clypeus.

***Galerucella univittata* sp. nov.**

Medium sized; olivaceous green, with the front edges and ridges of the thorax, the sutural and lateral edges and a narrow median vitta from the shoulder to the apex, and the legs more or less, fulvous yellow: whole upper surface finely punctate and covered with short sericeous pubescence: antennae short, reaching just below the shoulder, dark fulvous brown, lighter at base, 3 joint slightly the longest.

Type: 3 examples, Jatahy, Goyaz Prov., Brazil, ix, xi, 97. Length $4\frac{1}{2}$ –5 mm. (Coll. Bow.).

Head with the usual ridged clypeus, vertex rather broadly and deeply impressed longitudinally; thorax with a deep triangular depression on each side just in front of the shoulder, a shallow, double triangular depression on top, the apices meeting at the middle (hour-glass shaped, these depressions best seen from above in front), sides subangulate at the middle and slightly sinuate before the scutellum: elytral surface smooth, apex rounded; claws bifid.

***Galerucella conjuncta* sp. nov.**

Medium sized; olivaceous green, edges and raised parts of thorax, lateral edge of the elytra and a narrow median vitta from the back (nearly parallel to the suture) and joining the lateral edge to the apex, fulvous yellow; legs yellow with the tibiae and tarsi darker; antennae black, thickened towards the middle, 3 joint the longest.

Type: 1 example, Marcapata, Peru. Length $4\frac{1}{2}$ mm. (Coll. Bow.).

Head with clypeus raised as usual; front rugose, longitudinally depressed; thorax with rounded sides, deep lateral depressions (like *univittata*), upper surface with three minor depressions, two behind and one in front, rear edge lightly sinuate; elytral surface smooth without any trace of costae; the lateral edge and median vitta join at the apex; the entire upper surface of the body is finely punctate and covered with short golden pubescence; body below dark greenish fulvous; claws appendiculate (sexual difference?). The median vitta makes this form easy to separate.

Strictly speaking the appendiculate claws would exclude this form from *Galerucella*, but as a matter of convenience I retain it here for the present.

***Galerucella maculipennis* sp. nov.**

Medium sized, parallel; general colour bright olive green. mottled with grey on the elytra, body beneath green; legs greenish fulvous, with blackish tarsi; antennae short, fulvous, darker towards the tip, 3 joint the longest; claws bifid.

Type: 2 examples, Pery-Pery, Pernambuco. Length 4– $4\frac{1}{2}$ mm (Coll. Bow.).

Var.: ? 2 examples from Rio and Bahia, brownish in colour and with the markings less broken up.

Clypeus short, edge thickened; vertex and front of head extended, almost to the base of the antenna (covering the space usually occupied by the transverse groove), surface flattened, rugose, with a distinct longitudinal groove, running into a similar thoracic groove, which shows two well-marked foveae (hour-glass shaped), the anterior large diamond-shaped, the posterior smaller just before the scutel; the sides are each occupied by a deep longitudinal fovea; the lateral edge is slightly rounded anteriorly and the posterior sinuate at the middle, scutel dark fulvous; taking the grey colour as the ground-work, the elytra show traces of three stripes, the first subsutural, short, the second median, the third humeral, the last two more or less broken; the general effect is green, broken up into more or less irregular longitudinal green lines, the apex rather broadly grey. The entire upper surface is finely punctate and pubescent.

***Galerucella holosericae* (Dej.) sp. nov.**

Similar in size and colour to *marmorata* Jac., from Mexico: thorax fulvous, thickly punctate, with large black spots on either side; elytra light grey with three dark brown longitudinal stripes closely subsutural, median and sublateral, these more or less broken, wavy and split up in different examples, the whole surface punctate and closely pubescent; apex of elytra sinuate and with a distinct sutural spine.

Type: Rio Janeiro, St. Catherine, Blumenau (So. Br.), 6 examples. Length $5\frac{1}{2}$ –6 mm. (Coll. Bow.).

Antennae black, reaching nearly the middle of the elytra, 3 joint the longest, front and vertex all one piece reaching the antennae, faintly impressed in the middle and thickly punctate: thorax with deep side depressions and caniculate on top: elytra slightly widened behind, each side with two wavy costa-like lines, median and humeral, joining just before the apex, the spaces adjoining being more or less depressed: body below dark brown, legs dark rufous. I have retained the name attached to an old French specimen: the sutural spine is a distinguishing feature.

***Galerucella vittata* sp. nov.**

Medium sized, elongate and parallel; colour dark rufous or brownish: antennae and legs annulate with darker colour: each elytron with three longitudinal dark vittae, subsutural, median and sublateral, the first two united at the base and all joining at the apex; entire surface punctate and pubescent.

Type: Marcapata (?), Peru (3), Bolivia (2). Length 5 mm. (Coll. Bow.).

Antennae reaching the middle of the elytra: 3 joint the longest; head with a well-marked longitudinal furrow: thorax with deep lateral and two discal depressions, basal and apical: the colour of the thorax varies from entirely rufous to spotted with black, sides rounded, basal edge sinuate at the middle: if the ground-colour of the elytra is taken as brown it shows the suture, two vittae and the edge light coloured and slightly raised: the legs are rufous, with the knees and apex of the tibiae and tarsi dark: claws bifid. Resembles *venustula* Suff., from Cuba, but is much larger.

(To be continued.)

NOTES AND OBSERVATIONS.

THE SECOND BRITISH SPECIMEN OF *ANCYLIS TINEANA*, HB.—In *The Entomologist*, liii, p. 12, the late F. G. Whittle announced the capture of this hitherto unrecognised British Tortrix, a single example, in the Rannoch district. My friend during our visit to Sutherlandshire in 1921 acquainted me with the exact locality of his capture, and in June last, being in the district, I naturally did my best further to investigate the species. Unfortunately the weather

was anything but propitious: during the fortnight I was in the neighbourhood there was only one favourable day—June 14th. On this day I reached the ground at 4.30 p.m., and immediately on my arrival disturbed a small Tortrix from the heather; it flew about a yard, with slow heavy flight, enabling me to enclose it in my net. I saw at once it was a fresh example of *A. tineana*. Although I remained on the ground until 7 p.m., and passed several other afternoons and evenings there, no further examples were seen. The locality is a slope of about half an acre, precisely similar, so far as I could see, to dozens of other areas in the district. The prevailing growth was *Calluna vulgaris*, mixed with a few plants of *Erica cinerea*, *Vaccinium vitis-idaea*, *Potentilla prostrata*, *Trientalis europaea*, *Scabiosa* sp.? and some birch seedlings about six inches high. So far as I could judge the food-plant at Rannoch is one of these, possibly *Calluna vulgaris*, or the seedling birches. I do not think it is there attached to any of its known food-plants. Apparently *A. tineana* is a very sluggish species, which with its small size would account for its having escaped notice so long. Flying with it were examples of *Ancyliis uncana* and *A. unguicula*.—W. G. SHELDON.

HIBERNATION OF PYRAMEIS ATALANTA.—Some years ago now, somewhere about 1900, one of the maids found a specimen of *Pyrameis atalanta* asleep on one of the bedroom ceilings at Allington Rectory, near Grantham, Lincolnshire, in mid-winter; it was quite torpid when I got it, and I remember I put it in a cage and it at once settled on top, but it died before the spring, perhaps with its winter sleep being broken. Mr. Tutt, in his British Butterflies, Hedgerow and Woodland Series, evidently believed this species regularly hibernated in winter. He says: "It then hibernates in hollow trees, outhouses, barns, etc. After hibernation it rarely appears until the end of May, and hibernated specimens may be met with from then until July, within a week or two of the emergence of the earliest fresh specimens."—A. S. B. F. P. WYNNE; Upton House, Upton, nr. Southwell, Notts.

OCCURRENCE OF SATYRIDS IN WESTMORLAND, ETC.—Most species of butterflies seem to have been scarce and very late in appearing this season, possibly due to the unusually cold weather which prevailed right up to the few very hot days in early July; but the Satyrids appear to have been less erratic in this part of the country than butterflies of other families, and it would be of interest if other observers would give their experience on the subject. As regards first dates of appearance I have no records, and unfortunately I cannot speak about *Erebia epiphron*, as circumstances prevented an intended visit to its localities, but I certainly found the other Satyrids, occurring where I collect annually, quite up to their usual numbers. *Cuenonympha typhon* on June 27 and 28 at Witherslack and also on July 1 was less numerous than usual, but later on was flying in fair numbers, and though nearly all were then more or less worn, was fairly plentiful as late as July 29. *Satyrus semele*, *Epinephele jurtina* and *Cuenonympha pamphilus* were all out in fair numbers in the Witherslack district during my stay there between July 24 and Aug. 6, and a visit to the haunts of *Erebia aethiops* on Aug. 1 showed that species to be well out to time and in fine condition—in fact just as I

had found it on Aug. 6 last year. As regards the other butterflies : of *Argynnis aglaia* and *A. cydippe*, usually well represented at Witherslack, I only saw seven or eight examples between July 24 and Aug. 6, and about an equal number in one day near Silverdale ; and though *Aglais urticae* and *Pieris napi* were fairly common up to Aug. 6, *Gonepteryx rhamni*, *Pieris brassicae* and *Vanessa io* were not seen in the imaginal state. Numbers of larvae of *Aglais urticae* and a few of *Vanessa io* were seen to be still feeding on Aug. 5, and of *Pyrameis atalanta* on the same date only quite small larvae could be found. On the whole during the fortnight spent in the district few day-fliers were to be seen, though *Agrotis lucerneae* ♂♂ were common flying over rocky ground and stone walls, but by no means easy to catch ; and the abundance of *Anarta myrtilli* in both imaginal and larval states was noticeable. Larva searching was fairly productive, and among other things turned up were *Smerinthus ocellatus*, *S. populi*, *Lophopteryx camelinæ*, *L. carmelita* (one larva on sallow), *Cerura furcula*, *Saturnia carpinii*, *Asteroscopus sphinx* (one larva on ash, unfortunately stung), and *Amphidasyus betularia*.—T. M. BLACKMAN : 27, Black Bull Lane, Fulwood, Preston, Aug. 11, 1923.

THE FOOD-PLANT OF *CIDARIA TESTATA*.—On the evening of July 12th, 1923, whilst working Matley Bog in the New Forest, we obtained some two dozen larvae feeding on heather (*Calluna vulgaris*) which we were unable to identify at the time. Most of these larvae successfully pupated, spinning a very faint cocoon amongst the leaves of the food-plant. From August 6th onwards we were rather surprised to find that these pupae produced two male and one female imagines of *Cidaria testata*. On consulting the available references as to food-plants of these species in the wild state, we find that South and Scorer both quote "sallow and birch," L. W. Newman "sallow and aspen," whilst Barrett gives in addition "willow," and "on the Continent cranberry and sedum." We should be interested to know whether there are any other records of this species being found on *Calluna*. The larvae were very plentiful ; we only searched for them during a slack interval at the "sheet" which we had erected in front of the car headlights. Had we worked hard we could certainly have taken a hundred or so. The usual food-plants, willow and birch, were abundant on the roadside facing the bog, so there does not appear to be any question of the larvae taking to heather because the usual food-plant was not available.—M. M. MELROSE and A. H. PEACH ; 8, The Crescent, Plymouth.

HYBRIDISATION IN NATURE.—Referring to the note in the August issue of the capture of *Epinephele jurtina* and *Aphantopus hyperanthus* in cop., it is, I think, most unfortunate that they should have been killed. Why is it collectors so frequently kill these interesting things? Hybridisation is not, as far as we know, very common in feral nature, and a chance of getting wild hybrids should not have been missed—much interesting information might have been obtained by allowing them to fulfil their natural course, and in cases like this, if the captor is not able to carry out experiments himself, no doubt there is always someone who would if the matter were made known in *The Entomologist*.—T. E. CAMPBELL-TAYLOR ; Mavisthorpe, High Street, Southover, Lewes, August 8th, 1923.

VARIATION IN LEPIDOPTERA.—Mr. Huggins seems to think that I credit Mr. Porritt with ignorance respecting natural and sexual selection, which he asserts that every schoolboy of fourteen knows all about (I should say that at least ninety per cent. of present-day schoolboys are far more interested in knocking a ball about to care or know anything touching natural history). Because I presume that Mr. Porritt has studied the subject, the puzzle to me is why he does not see that primitive colouring must have been sombre before female animals began to take pleasure in improved tints.

If one knew everything one might understand why black, brown and white are the prevalent colours at the present time, although in some butterflies white and yellow occur in the same species, and in many the females still remain white although the males are bright yellow. Then we get black species in which blue is beginning to appear as shot-colouring, and brown species shot with purple. The development of colour in Nature is methodical as a rule—white changes to yellow, yellow to orange, so to scarlet, crimson, purple, blue; normally black first produces blue, and brown purple; but black (being a combination of all colour) may suddenly produce scarlet: these facts one learns by a study of animals of all kinds from all parts of the world. Pink and green could not evolve black and white.

Pigmental colours fade when exposed to light, black and brown as quickly as other colours, but the fossil *Neorinopsis sepulta* is as sharply defined and as distinctly coloured as its existing relative *Neorina lowii*; of course it was not exposed to light when entombed in the white sandstone of Aix-en-Provence, so it has retained its ancient character.

It is quite understandable why the majority of night-flying creatures are still of sombre colours; because in the dark the females cannot exercise much choice in selecting mates—indeed they frequently have to accept any male attracted to them by scent or light.—ARTHUR G. BUTLER.

Variation in Lepidoptera.—I have followed the correspondence on this subject for the last few months and would like to make the following remarks: Dr. Butler states that the light patches on the wings of Satyrine butterflies are a reversion to an albinistic ancestor; as these patches are generally asymmetrical, it appears more probable that they are due to some bleaching or chemical action during the pupal state of the insect. Further, how does he account for *M. galatea* producing both light and dark varieties? There are many other butterflies which give both dark and light sports, as, for example, *A. grossulariata*, the Lycaenids and *A. caia*. If these variations are due to reversion these insects must have had both dark and at the same time light ancestors. Abnormal conditions in the pupal or larval states give rise to many variations; the Vanessids give many striking varieties when the pupae are kept in a hot atmosphere. *A. caia* gives darker forms when the larvae are fed on food standing in a solution of salt. The phenomenon of melanism seems to be well explained by the vigour theory of Mr. J. L. Bonhote as put forward in his book, Vigour and Heredity. The last sixty years or so have seen a great increase of the manufacturing area in Yorkshire and Lancashire, and

it is probable therefore that insects of low vigour have tended to die out, thus the surviving species have gradually increased in vigour. As the vigour increases the colour darkens, the size increases, or the higher vigour is expended in some other way. Mr. Porritt states that melanic specimens have become more common during the last sixty years, which is exactly what this theory would lead us to expect. The production of brilliant colours in Lepidoptera by sexual selection leaves much to be desired. The sight of Lepidoptera seems to be very weak, and it seems absolutely impossible for the females of moths to distinguish colours at night. I have often seen females mate with either deformed or damaged males, and this seems to be a definite proof against the sexual selection theory. Assuming that the females have some influence by selection, this could not produce varieties which are necessarily sports from the normal; they could only mate with and thus increase the number of such sports.—D. G. SEVASTOPULO; 147, Gloucester Terrace, W. 2.

MELANISM IN LEPIDOPTERA.—A cool, humid, sunless climate seems to produce the most dark forms of Lepidoptera, *i. e.* Scotland, the North of England and North Ireland, which agrees with Mr. Porritt's "cold sunless summer" theory for dark specimens. The cause may be that in a moist climate rocks and trees, even the earth, woodwork and other resting places will naturally be a much darker shade, owing to the moisture on them, than they would in a light, sunny, dry climate. And so the dark forms would naturally escape being eaten by birds and other enemies. (It's a truth in nature that the environment makes the species.) I can hardly believe that black was the colour of the earliest forms of the Lepidoptera, as I know only two really black forms in Europe—*Odezia atrata* and the var. *doubleclayaria* of *Amphidasys betularia*—and these are not really black. They are inclined towards a sepia brown; they also have white on them and in both cases belong to the Geometers—by no means a primitive family of moths. If black was the original colour of the Lepidoptera, we ought to find pure black species in such families as the Hepialidae (Swift Moths) or the Micropterygidae and other early forms. I think it more likely the colouring of the early Lepidoptera was of an ochreous fuscous colour; it all points to that. Many writers think the Lepidoptera sprang from the Trichoptera (caddis-flies), in which case they would naturally follow the type of colouring common to that order. Mr. Porritt seems to squash the sexual selection theory of Dr. Butler's infallible scientific pope, Charles Darwin, with his evidence of any male pairing with any female. But it seems hard to believe that such forms as the male of *Euchloe cardamines* and the satin white ♂ of *Hepialus humuli* have not been formed by sexual selection.—A. S. B. F. P. WYNNE; Upton House, Upton, nr. Southwell, Notts.

CIVIL PENSION.—We were greatly pleased to see amongst a recent list of those to whom Civil Pensions had been granted the name of Alice Harriette Bacot, the sister of the late A. W. Bacot. No better Entomologist ever lived than Arthur Bacot, who, it will be remembered, gave up his life last year for the cause of science. It is satisfactory that the State has recognised its duty to make a provision for those who were dependent upon him.—W. G. S.

CULEX PIPIENS L.: AN ADDITIONAL CONTROL METHOD.—Although the common gnat (*Culex pipiens* L.) has of late years received some attention on account of various cases of death from blood poisoning consequent upon gnat-bites, yet few serious attempts seem to have been made to combat the pest. The control methods most commonly advocated are directed against the early stages, larvae and pupae. Such measures, if thoroughly carried out, would, no doubt, considerably reduce the numbers of *Culex*, but the breeding-places of the insect are not always easily accessible, and it would also seem that much useful work could be directed against the hibernating adult female.

It is a known, but little emphasised, fact that the impregnated female *Culex pipiens* hibernates in outhouses and cellars, often in considerable numbers. At the end of the season, from August onwards, the females, after pairing, seek suitable winter quarters and remain in semi-torpid condition throughout the entire cold weather. The body-cavity of the female at this time is largely filled with fat-body, and the eggs in the ovaries are undeveloped. In spring activity is resumed, the winter shelter is left, and egg-laying commences as soon as the ovaries become functional.

For some years past the writer has made observations on hibernating mosquitoes in the suburban district of Walthamstow. Many cellars here teem with hibernating females in winter. Last year, in November, they could be seen resting on the ceiling of one cellar as many as 100 to 150 to the square foot, and in some places the insects were even more densely placed than this. It was calculated that the cellar in question contained as a minimum 13,000 hibernating females, and possibly twice this number. With such sources of re-infection in every town, it is no wonder that the numbers of *Culex pipiens* remain high and that the insects become a nuisance early in summer. The period of hibernation would therefore appear to be a very favourable time to attack the insect.

Various methods have been tried, fumigating and spraying, but spraying in cellars appears to be best in every way. Many fly sprays will cause the insects to fall apparently dead, but later recovery is frequent, as the spray fluid apparently has difficulty in penetrating the scaly pubescence of the insect's body, and only causes temporary paralysis. Two sprays were found to kill efficiently. One contained corrosive sublimate, HgCl_2 , and is therefore not to be recommended; the other was crude commercial tetrahydronaphthaline $\text{C}_{10}\text{H}_8(\text{OH})_4$. The latter, with modifications, is also known by several trade names. Tetrahydronaphthaline is most effective against *Culex*, and kills with certainty after very light spraying. A fine spray is the best to use. Many light oils are also effective as sprays, but all those tested appear to have some disadvantage or other, and cannot be altogether recommended. The best time for spraying is in November or December, when the insects are most torpid and in greatest numbers.

The object of the present note is merely to bring to notice an apparently neglected check method against *Culex pipiens*, and not to reveal any new facts of its biology.—C. L. WITHEYCOMBE.

BRITISH ASSOCIATION.—Several papers of interest to Entomologists are due to be read at the coming meeting of the British Association at Liverpool from September 12th 19th. The subjects to be dealt

with include: A New Discovery in Mimicry (Prof. E. B. Poulton, F.R.S.), Polyhedral Disease in the Vapourer Moth (Dr. J. W. Heslop Harrison), Parthogenesis in Sawflies (A. D. Peacock), Evolution of Aphids with Complex Life-Cycles (E. R. Speyer), The Timber-fly and the Congo Floor-maggot (Prof. D. B. Blacklock), and Observations on the Biology of *Perilitus rutilus* Nees (Miss D. J. Jackson).—N. D. R.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*June 14th, 1923.*—Mr. E. J. Bunnett, M.A., F.E.S., Vice-President, in the Chair.—Mr. Brown, on behalf of Miss Cheesman, exhibited specimens of *Pyrophorus* (Col.) from Trinidad, and stated the cause of the light to be the oxidisation of the digestive fluid and the fat-bodies; Mr. Leeds, a larva of *Strymon pruni* about to pupate, partly eaten by another larva; Mr. Bunnett, *Cryptocephalus parvulus* (Col.) from Oxshott.

June 28th, 1923.—Mr. E. J. Bunnett, M.A., F.E.S., Vice-President, in the Chair.—Mr. S. N. A. Jacobs, of Catford Hill, S.E. 6, was elected a member.—Mr. Hugh Main exhibited cocoons and a living female of *Heterogynis penella* from St. Martin Vesubie, *Ascalaphus ottomanus* (Neur.) from S. France, and a Nemopterid larva with elongate prothorax; Mr. Blenkarn, *Cryptocephalus nitidulus* from Mickleham; Mr. Parker, a bred *Mimas tiliae* of a very variegated rich red-purple coloration; Mr. Cheesman, two *Argynnis aglaia*, one with dark brown suffusion on the green areas of the underside, the female with an excess of deep black areas on the upperside; Mr. Bunnett, on behalf of Mr. Pinhey, a collection of butterflies and moths and other insects, illustrative of the Fauna of Ceylon; he also showed *Ephestia ficulella*, bred from chocolates; Messrs. O. R. and A. de B. Goodman, T. H. L. Grosvenor and Hy. J. Turner, a large number of European and Eastern Argynnids to illustrate Mr. O. R. Goodman's paper.—Mr. O. R. Goodman read a short paper initiating a discussion on the Three Larger British Argynnids.

July 12th, 1923.—Mr. N. D. Riley, F.Z.S., F.E.S., President in the Chair.—Mr. Main exhibited the living *Emus hirtus* ♀ (Col.) exhibited in July, 1922, with ova and young grubs produced in captivity, also young larvae of *Heterogynis pennella*, which fed readily on laburnum; Mr. Hodgson, varied series of females of *Agriades thelis* and *Polyommatus icarus* from the Cotswolds; the President, on behalf of Mr. Littlewood, specimens of *Macrothylacia rubi* bred by forcing in November and December without cold influence intervening.—Mr. Grosvenor reported only form *hippocrepidis* of *Zygæna filipendulae* from a locality which had hitherto produced only the typical form.—Mr. Turner exhibited living bred imagines of *Oidametophorus lithodactylus* from Lyme Regis, much more variegated than most continental forms shown, stems of *Viburnum* showing the exit cap and projecting chrysalis of *Aegeria andraeniformis*, and a very long series of *Polyommatus dolus* from Central and South France, Central Italy, and Asia Minor, showing the racial variation, and communicated notes on the species.—H. J. TURNER, *Hon. Editor of Proceedings.*

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NOTES ON BRITISH NEUROPTERA (INCLUDING MEGALOPTERA AND MECOPTERA) IN 1922.

BY W. J. LUCAS, B.A., F.E.S.

Alderflies.—*Sialis lutaria*, Linn. was first noticed on 7 May at Blackwater in the New Forest; one was captured in the Home Park of Hampton Court in Middlesex on 22 May; and it was met with on Esher Common in Surrey on 26 May.

Snakeflies.—*Raphidia notata*, Fabr. was captured (a female) on 30 May at Bentley Copse near Peaslake in Surrey. On 21 August, near Lyndhurst in the New Forest, a larva was captured, presumably of this species, which a few days later was taken to Kingston-on-Thames. There it was fed on freshly killed houseflies, which it seemed to like, eating out the contents of the abdomen from the ventral side but leaving the dorsal skin intact. It was last noticed to have been so feeding on 5 November. During the winter it ate nothing except possibly a few aphides, but if it did so it was not noticed in the act. On a flat surface it "progressed backwards" with fair rapidity by a series of "steps," something like those made by a looper caterpillar. It remained a lively larva throughout the winter, the interior of the box it inhabited in a sitting-room being often very dry. On 9 May 1923 this larva was sent to G. Fox Wilson at Wisley. Whether it will pupate and produce an imago remains to be seen. On 23 September a few larvae of *R. notata* were found on Ockham Common in Surrey, and one which appeared to be of this species was dead, attacked by the fungus *Empusa (lampyridarum?)*. On this common also a number of larvae of *R. maculicollis*, Steph. were found under bark of Scotch Firs, especially on stumps left in the ground after the trees had been cut down. One, apparently *R. maculicollis*, had been stung by a parasite whose cocoon was beside it. This species appeared to be ready to pupate. The description of a larva is as follows:—Length about 12 mm. Head and prothorax rectangular, chestnut above and below; meso- and metathorax yellowish, blotched with brown; antennae pale with three darker rings; mandibles dark chocolate; eyes black; legs pale, with slightly darker claws. Abdomen scantily clothed with hairs; above pale yellow, with dark chocolate blotches arranged so as to give the appearance of four dark lines separated by

three narrow yellow ones, all, however, interrupted; under-surface pale yellow, with pale brown blotches on most segments arranged four in a segment; edges of abdomen also pale brown. The larva of *R. notata* seems to differ superficially from that of *R. maculicollis* chiefly in the larger size and in the yellow part of the colouring being less extended so that the larva looks darker. Only a few examples have passed under my notice, but this difference appears to be constant. A female *R. maculicollis* was taken at Bentley Copse on 11 June.

Brown Lacewings.—*Osmylus chrysops*, Linn. was noticed for the first time on 16 June at Blackwater in the New Forest, and appeared to be plentiful. One *Hemerobius nitidulus*, Fabr. was taken at Rhinefield in the Forest on 7 May. *H. micans*, Oliv. was found amongst hazel at Witherslack in Westmorland on 16 June (T. M. Blackman). *H. lutescens*, Fabr. was captured on 11 June at Preston in Lancashire, and on 21 June at Witherslack (Blackman); on 20 June at Chalfont Road in Bucks, and on 27 July at Stanmore Common in Middlesex (R. South); on 21 Sept., beaten in the evening from hawthorn, in Shibden Dale near Halifax in Yorkshire (G. T. Lyle). The earliest specimens of *H. stigma*, Steph. were two caught on the wing at Esher Common in Surrey on 30 Jan.; it was taken in connection with Scotch Fir (*Pinus sylvestris*, Linn.) in the New Forest on 20, 22, and 26 April; again in the Forest on 21 June; and near Ockham in Surrey on 23 September. *H. orotypus*, Walleng. occurred amongst pine trees on 9 May at Langridge in Lancashire (Blackman). Of *Boriomyia subnebulosa*, Steph. a dark specimen was beaten from hawthorn in the evening of 21 Sept. in Shibden Dale (Lyle). *B. concinna*, Steph. was taken near Brockenhurst in the New Forest on 14 June (Lucas), and at Witherslack on 20 and 23 June (Blackman). At Chalfont Road South took *Micromus paganus*, Linn. on 15 June, and *M. variegatus*, Fabr. on 20 June.

Green Lacewings.—Of this family the following captures were made, or records came to hand:—*Chrysopa vittata*, Wesm., Witherslack, 22 June (Blackman). *C. vulgaris*, Sch. on 7 May at a window in Alton, Hants (E. A. C. Stowell); and near Ockham on 23 September. *C. flava*, Scop. Witherslack in a garden on 20 June; *C. tenella*, Sch. Preston on 8 June; and *C. alba*, Linn. Witherslack on 20 June (Blackman). *C. flavifrons*, Brauer on 17 June at Chalfont Road (South); on 15 July near Horsley in Surrey. *C. prasina*, Burm. (= *aspersa*, Wesm.) on 21 June, 22 June and 1 July in the New Forest; on 15 July near Horsley; and on 27 July one in the New Forest with a black spot on the swollen basal segment of each antenna. *C. ventralis*, Curtis in the New Forest on 14 June, and on 22 June in the Forest with *C. prasina* from which it is doubtfully distinct. *C. phyllochroma*, Wesm. on 17 and 18 June at Chalfont Road (South). *C. perla*,

Linn. at Esher Common on 26 May, and at Bentley Copse on 30 May; at Chalfont Road on 17 June (South); at Witherslack on 24 June amongst birches on peat-moss (Blackman); and at Netley Heath in Surrey on 15 July.

Dusty Wings.—*Coniopteryx pygmaea*, Ender. was found near Wisley in Surrey during the S. Lond. Ent. and Nat. Hist. Society's excursion on 23 September.

Scorpion-flies.—*Panorpa communis*, Linn. was first noticed on 16 June—in the New Forest; South took it at Chalfont Road on 20 June. Of *P. germanica*, Linn. a male was taken on 26 May at Esher Common, a female at Bentley Copse on 30 May, and a female near Ockham on 23 September.

Kingston-on-Thames;

14 May, 1923.

PERONEA HASTIANA, L.: ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 202.)

Combustana Group.

Forms having a white, cream-coloured, or ochreous vitta along the inner margin of the superiors, the ground-colour being various shades of brown.

(39) ab. *combustana* Hüb.

Synonymy.—Hübner, Tort. fig. 234 (1818); Id., Verz. p. 384, No. 3721 (1826); Frölich, Tort. Wurt. p. 21 (1828) (*crisana*); Stephens, Cat. ii, p. 186, No. 7064 (1829); Treitschke, Schmett. von. Eur. viii, p. 258 (1830) (*sparsana*); Rennie, Conspect. p. 177 (1832); Stephens, Haust. vol. iv, p. 155 (1834); Duponchel, Lep. de France, vol. ix, p. 157, and pl. ccxlv, fig. 2 (1834) (*crisana* ab. *sequana*); Curtis, Brit. Ent. 2nd edn., 16, No. 13 (post 1834); Id., Guide 2nd edn., p. 202 (1837); Wood, Index Ent. No. 1068 (1839); Westwood, Brit. Moths, vol. ii, pl. xciii, fig. 12 (1845); Heinemann, Schmett. Deutsch. und Schweiz, i, p. 15 (1865); Staudinger, Cat. Lep. Eur. ii, No. 652 (1871); Snellen, Vlind. Ned. Micr. p. 177 (1882); Staudinger, Cat. Pal. Lep. vol. ii, p. 80, No. 1446h (1901); Kennel, Pal. Tort. pl. iv, fig. 1, and p. 72 (1908); Spüler, Schmett. von Eur. vol. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Hübner figured and named this aberration, but as he did not describe it I have made the following description from his figure:—

Superiors dark brown with the following exceptions: a central vitta of pale ochreous colour extending from the base in a direct line to the termen, but stopping short of it; a vitta of the same colour running along the inner margin from the base almost to the anal angle. The dark shoulder-mark shows prominently; the usual transverse striga or band shows up in the dark ground-colour from the costal margin as far as the front edge of the central vitta; the head and thorax are dark brown; in the centre of the latter there is an ochreous spot. The hind wings are light grey, darker around the outer margins.

Ab. combustana is not uncommon in many localities, but not in all. I have examples from Wimbledon (a considerable number), Kent, Wicken, Sligo, Morpeth, and one from Invershin, where, as in all the Scotch localities I have collected in, it appears to be rare. In place of it one of the following forms of the group are found.

(40) *ab. scoticana* n. ab. (Plate 2, fig. 10.)

The difference between this aberration and the last is, that the wings, with the exception of the pale inner marginal vitta, are uniformly dark brown, the central pale vitta so prominent in *ab. combustana* being lost in the dark brown ground-colour, and the light transverse striga being much less distinct.

So far as my knowledge goes, *ab. scoticana* is almost entirely a Scotch form, occurring at Rannoch, Invershin, Lochinver, and Soyea—in fact in all Scotch localities from which I possess specimens. I have one example from Wicken. The type is from Rannoch.

(41) *ab. griseo-vittana* n. ab.

Synonymy.—Barrett, Brit. Lep. pl. ccccliii, fig. 1a (1905).

This form is similar to the last except that the inner marginal vitta is white, in some instances sparsely sprinkled with black scales. Barrett's figure does not quite agree with the type, the ground-colour not being so dark, but it is nearer to it than it is to any other aberration.

I have not seen examples of *ab. griseo-vittana* from any locality except Lochinver. In 1921 I bred out, from larvae obtained there, seventeen specimens, one of course being the type.

Mayrana Group.

I now come to a very remarkable group, with a vitta, lighter than the surrounding area of the superiors, commencing in the centre of the base, and extending in a more or less direct line to the termen. Before describing any of the forms pertaining to it I must, however, deal with a remarkable form combining its central light vitta with

the inner marginal vitta found in the preceding groups. I call this form—

(42) ab. **bivittana** n. ab. (Plate 2, fig. 15.)

and describe it as follows: Superiors very dark brown, with a central, light ochreous, or cream-coloured vitta, and another on the inner margin, white, thickly sprinkled with dark brown scales.

Although by no means a common form, it is widely distributed, and may be expected to occur in many localities producing the next described aberration. I have five examples, including the type, from Kent, and two from Lochinver.

(43) ab. *mayrana* Hüb.

Synonymy.—Hübner, Tort. fig. 335 (1834); Bruard, Cat. Lep. Doubs. p. 34 (1847) (*longipartitana*); Heinemann, Schmett. Deutsch. und Schweiz, i, p. 15 (1865); Staudinger, Cat. Lep. Eur. ii, No. 652N (1871); Snellen, Vlind. Ned. Micr. p. 177 (1882); Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1446L (1901); Barrett, Brit. Lep. pl. ccccliii, fig. 1d (1905); Kennel, Pal. Tort. pl. iv, fig. 5 (1908); Spuler, Schmett. von Eur. vol. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Hübner figured and named ab. *mayrana* but did not describe it. The following is a description I have made from his figure: Head, thorax and superiors very dark brown (almost black); the central vitta (pale straw colour), extends from base to termen; at the terminal extremity it is branched into three points. Inferiors grey, darker near the external margin; the venation is distinct; along the costal margin from base to termen is a pale straw-coloured band.

In all the British specimens of this aberration I have seen, many scores in number, the division of the central vitta into three branches does not occur, but occasionally there is a trace of a second branch. The pale band on the costal margin of the inferiors, although it is common to many *hastiana* aberrations, is not by any means so prominent in British specimens as shown in Hübner's figure.

This beautiful form is by no means uncommon in most localities from which I have bred or received *hastiana*; it is abundant in a certain Kentish locality. I have examples also from Wicken. In the north it is not uncommon in Lancashire, occurs at Rannoch, and in 1921 I bred large numbers from Lochinver, Soyey, and Invershin, in Sutherlandshire.

(44) ab. **fasciana** n. ab.

Forms resembling the last in every respect except that they have a more or less distinct pale transverse striga crossing the superiors

are not uncommon in Britain, and to these I give the name *ab. fasciana*. I have them from Kent, the Isle of Wight, Wimbledon, Lochinver, Soyea, and Lancashire; the type is a Lochinver specimen.

(45) *ab. albovittana* n. ab.

A form resembling *ab. mayrana* in all respects except that the central vitta is white instead of cream-coloured.

A rare form which I have only from Kent, Wimbledon and Wicken. The type is a Wimbledon example.

(46) *ab. allostriana* n. ab.

Resembling the last in all respects except that it has in addition the usual transverse pale fascia. I have this aberration from Kent, the Isle of Wight and Wimbledon; the type is from the latter locality. I have found it equally rare as the last.

(47) *ab. ochreovittana* n. ab.

This aberration resembles *ab. mayrana* in all respects except that the central vitta is rich ochreous yellow in colour. Of course the vitta is not branched as in Hübner's figure of *mayrana*, but resembles in shape that of British *mayrana*.

Ab. ochreovittana is not uncommon in many British localities. I have specimens from Kent, Wimbledon, Wicken, Lancashire, Lochinver and Soyea; my type comes from Lochinver.

(48) *ab. rufivittana* n. ab.

Synonymy.—Kennel, Pal. Tort. pl. iv, fig. 8 (1908) (*centrovittana*).

This aberration is similar to the last in all respects with the exception that the vitta is red.

So far as my knowledge goes, *ab. rufivittana* is entirely a Lancashire form, and it is rare there. I have six examples, including the type, for which I am indebted to the kindness of Mr. Mansbridge.

(49) *ab. fulvovittana* n. ab.

Similar to the last except that the ground-colour of the superiors is light reddish brown.

Ab. fulvovittana is very rare. I have one example, the type, from Wimbledon, and I have seen others in collections.

(50) *ab. subvittana* n. ab. (Plate 2, fig. 16.)

Similar in all respects to *ab. mayrana* except that the central vitta is suffused with dark scaling, the nature of which can best be seen by reference to the figure.

This aberration is also rare ; I have one example from Lancashire, the type, and another from Kent.

(51) ab. *brevivittana* n. ab.

The superiors are dark brown, the usual light transverse band being only slightly lighter in colour than the adjoining areas ; from the centre of the base to the outer edge of the light transverse band is a fulvous vitta.

So far as I am aware this aberration has only occurred in Lancashire. I am indebted to the kindness of Mr. Mansbridge for several examples of it, including of course the type-specimen.

(52) ab. *centrovittana* Stphns.

Synonymy.—Stephens, *Haust.* iv, p. 154 (1834) ; *Id.*, *Cat.* ii, p. 186, No. 7062 (1829) ; Curtis, *Guide*, 1st edn., p. 174 (1829) ; *Id.*, *Brit. Ent.* 2nd edn., 16, No. 31 (post 1834) ; *Id.*, *Guide*, 2nd edn., p. 202 (1837) ; Wood, *Index Ent.* No. 1067 (1839) ; Westwood, *Brit. Moths*, vol. ii, pl. xciii, fig. 10, and p. 157 (1845) ; Staudinger, *Cat. Lep. Eur.* ii, No. 6520 (1871) ; Snellen, *Vlind. Ned. Micr.* p. 177 (1882) ; Kennel, *Pal. Tort.* pl. iv, figs. 6 and 7, and p. 72 (1908) ; Spuler, *Schmett Eur.* ii, p. 241 (1910) ; Meyrick, *Gen. Ins.*, fasc. 149, p. 65 (1913).

The references given above previous to 1834 give the name only without description.

Original description.—Anterior wings testaceous brown, shining, with a broad pale fuscous testaceous dash extending from the base to the apex, and numerous oblique radiating ustulated brown streaks, extending on one side to the costa, and on the other to the hinder margin ; posterior wings whitish brown, variable ; in some examples the anterior wings have an oblique, abbreviated pale griseous fascia, a little before the middle, edged with fuscous ; others have them clouded with a pale leaden brown (Stephens, *l.c.*, 1834).

Stephens' description is difficult to follow. One hardly knows what is the meaning of "testaceous brown, shining," but we should consult Wood (fig. 1067), for of course Wood had access to Stephens' Collection (*see* Introduction to *Index Entomologicus*, p. 5), and there is no doubt that this figure represents the type-specimen. The "oblique, abbreviated pale fuscous fascia" alluded to by Stephens as characterising some examples of his series is prominently shown in Wood's figure.

It is one of the misfortunes attendant upon the treatment meted out to the Stephens' Collection at the British Museum that the type is missing.

Ab. *centrovittana* is not uncommon, but apparently it is a southern

form only. I have not seen it from a locality north of Wicken. I have examples from Kent, Isle of Wight, Wimbledon, and Wicken.

(To be continued.)

FURTHER NOTES ON FORCING LARVAE OF MACRO- THYLACIA (BOMBYX) RUBI.

BY FRANK LITTLEWOOD.

THE present article supplements and completes my previous notes on this subject, which appeared in the February number of this year's *Entomologist*.

Continuing the tale of the damp cage No. 1a, which, it may be remembered, had already yielded 6 fine pupae, and was left with 4 healthy larvae, by Dec. 7th (24th day) two of these larvae had spun up and changed successfully; one of the others died on Dec. 12th, the other on the 23rd, having withstood a daily (or rather, nightly) temperature of 90°-95° F. for nearly six weeks before giving in! However, 8 good pupae out of 12 larvae was a fairly encouraging result, and I was not disposed to grumble. A further trial of dry-heat throughout failed just as miserably as in cage No. 2, referred to previously. Another attempt, with dry-heat for the first 4 days, followed by moisture, yielded 50% of pupae—a better result, certainly, but still not so good as the damp cages were now producing.

Having satisfied myself, by this time, that a certain amount of moisture was essential to the well-being of the larvae, the problem resolved itself into one of devising a simple and, if possible, a more effectual method of applying the moisture; for daily spraying, etc., when continued for weeks, becomes tedious. To this end I procured from the grocer an empty full-sized (10 lb.) biscuit tin, and in the bottom placed about an inch depth of really wet peat-soil. I next knocked together 3 trays, which fitted easily into the tin, one above another. The trays had wood sides and a perforated zinc bottom. Two slips of wood nailed to the bottom of each tray raised the lower one clear of the wet peat-soil, and permitted the moist air to circulate freely between the others. Each of the trays accommodated 12 roomy cardboard pillboxes, and in each box I placed a single larva, together with a morsel of dry moss. By removing the top of the lids of the pillboxes and replacing them with black net gauze, I was enabled to see, readily, each day what the individual larvae were doing. The lid of the biscuit-tin was nearly, but not completely closed, about 1 in. space being left for ventilation. Thirty-six larvae were thus put in to force in one batch, in the same old position above the hot-water cylinder.

It will be noted now that the larvae, from the very com-

mencement of their forcing, were entirely surrounded by an atmosphere at once warm and moist, but that they did not come into actual contact with either wet soil or moss. Re-damping was only necessary every fourth or fifth day, and was accomplished simply by holding the tin under the tap for a moment, without in any way disturbing the contents. The pillboxes themselves did not suffer appreciably by their internment in the damp tin, and it was very convenient to have each cocoon separate and get-at-able, instead of, as previously, matted together in a bunch and difficult to disentangle. Two larvae spun up on the second day, and others each day until the tenth day, when 33 out of the 36 had formed cocoons. In every case, as soon as the pupa was formed I removed the pillbox containing it to the pupa-cage, which was kept in a somewhat cooler part of the same cupboard.

I followed this batch with another of the same size and treated in exactly the same way. Curiously enough the result, too, was identical—33 pupae out of 36 larvae—so that 72 larvae gave me very nearly 92% of healthy pupae, which seemed to be reasonably complete success, and a much better result than I had ever hoped to achieve.

In these later batches the cocoons, generally, were more normal—longer, roomy, more opaque and much tougher than before; occasional cocoons still, however, remained flimsy and open, and one was quite spherical, just like a big “marble,” but the larva in this aberration failed to change properly. Once the pupal stage was reached the mortality was very trifling; less than 5% failed to emerge, and there were remarkably few crippled specimens.

The males are variable, but within the ordinary limits; a few of the females are distinctly grey, but the majority are a warm brown. One rather curious variety occurred—a female; and this has the outer pale transverse bar of the right fore wing looped into a little “ring” on the inner side and towards the inner margin of the wing. Another female, a small one unfortunately, has the two bars broadly coalescent and situated in the position of the first usual line. It is a pretty form.

The greater success which attended my later batches *may* have been attributed to the longer rest the larvae had enjoyed before they were forced; but inasmuch as they had not any of them, by reason of the exceptional mildness of the present winter, experienced any greater degree of cold than had the earlier batches, I am inclined to believe that the different method of treatment deserves the credit, and that had the later arrangements been adopted at first—so soon, in fact, as the larvae had finished feeding—the results, then, would have been equally satisfactory.

22, Highgate,
Kendal.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE
BRITISH BRACONIDAE.

BY G. T. LYLE, F.E.S.

(Continued from p. 149.)

Inanitus, Nees.*

OUR largest and, probably, commonest British species; it has a length of 5 mm. and expands 9 mm. The metathorax is short and the hind tibiae usually black-tipped (the colour of the legs, however, varies considerably). The abdomen often has two rounded basal yellow spots; these also are inconstant, varying greatly in size and very frequently being entirely absent. In 42 males I recently examined 3 only had the spots well developed, 7 had small spots, while in no less than 32 the abdomen was immaculate; in the same number of females, 17 showed large spots, 14 smaller ones, and in only 11 cases was the abdomen spotless; these specimens were from many localities. Marshall mentions that in 67 specimens taken by himself at the same time and place in the Isle of Wight the spots appeared but seldom in the males and only in a minority of the females.

The Fitch Collection contains some 30 or 40 examples, several taken by Marshall, and two bred by Elisha from larvae of *Catoptria tripoliaria*; one of these has the hind femora much darker than is usual. The Dale Collection also has a good number, all without data, excepting one, which is labelled "Newcastle." There are several specimens in the Hope Collection; one bears a label on which is written "Also Waterhouse, several specimens at Earl's Court July, 1827." Harwood has a number from the Colchester district and some from "Boxhill 1885," the latter probably taken by Dr. Capron. I have myself found the insect particularly common along the muddy north shore of the Solent between Lymington Pier and the mouth of the Beaulieu River, although in the New Forest it is very scarce. In 1913 I was much struck by the numbers to be seen resting on the flowers of *Daucus carota* growing among pebbles under the walls of Hurst Castle. This fort stands at the end of the well-known Hurst Beach, a promontory of pebbles a mile or so in length, on which no trees or bushes excepting brambles exist; indeed, there is little vegetation beyond sparse grass, thistles, ragwort and such shore-loving plants as yellow horned poppy, false samphire, etc. On the N. Norfolk coast at Wells and Blakeney I have also found it abundantly, and have

* Mon., i, p. 289.

captured many on the Gog Magog Hills and Fleam Dyke in Cambridgeshire. All my specimens were taken in the months of July and August.

Submuticus, Wesm.*

This species is included in the British list on the strength of a record by Marshall of a single female: the specimen is still in the Fitch Collection and bears Marshall's name-label. To me it seems to be merely a large *inanitus*; the generative organs, however, are hidden. The obtuse abdomen mentioned by Marshall is very noticeable and so are the prominent denticles of the metathorax and the two blunter lateral angulations. The last character, however, is shared by many male specimens of *inanitus*, in which species the size of the denticles shows very considerable variation.

In the British Museum is a specimen under this name labelled "Type." Why, I cannot understand; it was taken by Dr. Capron at Shere.

Wesmaelii, Curtis.†

Apparently not taken since the time of Curtis. Walker gave a single specimen to Marshall and said he possessed others; these, according to Prof. Westwood, were in the Hope Museum Collection and numbered 334. Through the kindness of Prof. Poulton I have been able to examine three specimens so numbered, but they are certainly not *C. wesmaelii*, but probably *C. sulcatus* or a nearly allied species; there are certainly no examples of *C. wesmaelii* in the Oxford Collection at the present time.

Carbonator, Marsh.‡

Described by Marshall from two males and two females; one of these, said to be a female, is still in the Fitch Collection and bears Marshall's yellow label; the card is marked "Eaton 1/6/84." The species is very close to *inanitus*, but is smaller (length $3\frac{1}{2}$ –4 mm.) and has the hind tibiae "black with a sub-ferrugineous ring or broadly black at apex and annulated with fuscous near base." I must mention that I have seen specimens of *inanitus* in which this coloration is approached. A doubtful specimen mentioned by Marshall is also in the Fitch Collection; this is a male with a length of 5 mm. and 29-jointed antennae, which I am inclined to think may be a dark var. of *inanitus*.

I have never come across a living insect, but Morley says he swept it commonly from *Limonium statice* at Holme, Norfolk, in August.

* Nouv. Mem. Ac. Brux., 1835, p. 218.

† B. E., pl. clxxii.

‡ Trans. Entom. Soc., 1885, p. 123.

RHOPALOCERA OF CONSTANTINOPLE.

BY MAJOR C. K. G. DICK, R.A.M.C.

MILITARY service having precluded continuous observations, no pretence to a systematic account of the Rhopalocera of Constantinople is here made, yet it is hoped that the following notes on fifty-nine butterflies from the neighbourhood, obtained during the years 1921 and 1922, may prove of some interest. In several species only one example can be recorded and possibly others may have been entirely missed. Except as stated, all collecting was done within a few miles' radius of a military hospital at Mashlak, which is some five miles north-east of Constantinople. Thus, the Belgrade Forest, which is doubtless a rich collecting area, was hardly touched. The country is undulating and traversed by deep rocky ravines, which are seldom completely dry. Low vegetation is abundant. I desire to acknowledge with gratitude my indebtedness to Mr. N. D. Riley and to Messrs. Watkins and Doncaster for identifying specimens when I have been in doubt.

Papilio podalirius.—Generally common. May to July. No record before or after these dates for either year. [In my experience double-brooded and often occurring in August.—P. P. GRAVES.]

P. machaon.—Generally common. Earliest record 26.3.22. Latest record 23.9.22.

Aporia crataegi.—Generally common. Appears in May.

Pieris brassicae.—A few examples.

P. rapae.—Generally common.

P. napi.—One specimen taken 24.3.21. No special search made for this species. [Common near Constantinople.—P. P. G.]

P. daplidice.—Generally common. Earliest record 13.3.22.

Leptosia sinapis.—Fairly common. Several examples of var. *diniensis* taken. [This form *diniensis* is abundant in summer in most of the woods near the Bosphorus.—P. P. G.]

Colias croceus.—Generally common. Earliest record 11.3.22. Var. *helice* not observed. [The ♀ form *helice* is not uncommon in my experience.—P. P. G.]

Gonepteryx rhamni.—Not uncommon.

Strymon ilicis.—Common in woods, including var. *caudatula*.

Callophrys rubi.—Generally common. March to May.

Heodes thersamon.—Confined to a single locality. All but one of the few examples taken males. [This agrees with my experience on the European side of the Bosphorus. On the Asiatic side *H. thersamon* is often most abundant.—P. P. G.]

H. alciphron.—Locally common. Appears in May. The beauty of this insect in its natural haunts is most striking.

[The Constantinople race of *alciphron* is a large form of *meliboeus*.—P. P. G.]

H. phlaeas.—Generally common.

Plebeius argus (*aegon*).—Generally common. [The Constantinople race of *P. argus* is very like our British "heath form."—P. P. G.]

Scolitantides baton.—Fairly common. Appeared before the end of March in 1922.

Polyommatus astrarche.—Not uncommon.

P. anteros.—A few examples. August and September. [*P. anteros* has three broods at Constantinople, viz. in May to beginning of June, July and September to beginning of October. In my experience it is frequent except on the limestone.—P. P. G.]

P. icarus.—Generally common.

Lycaenopsis argiolus.—Locally common.

Nomiades semiargus.—Locally common. [Constantinople specimens agree with Tutt's *intermedia*. They strike me as a large form of *parnassia* Stdgr.—P. P. G.]

N. cyllarus.—A few examples. Appears in April.

Lycaena arion.—One example taken by a friend 11.6.22. No other seen at any time. [This species is very local at Constantinople. I only know of two restricted localities near Therapia where it occurs.—P. P. G.]

Libythea celtis.—A friend captured one specimen whilst we were collecting together 7.3.22. No other seen at any time. [Always rare near Constantinople.—P. P. G.]

Limenitis camilla.—Generally common.

Polygonia egea.—Not uncommon. Although this species appeared to predominate, a specimen taken at Biyukdere approximated closely to *c-album*. [It probably was *P. c-album*, which is not uncommon in some localities near Constantinople.—P. P. G.]

Vanessa polychloros.—Fairly common.

V. io.—Generally common.

V. antiopa.—Not uncommon. [In my experience rather rare.—P. P. G.]

V. atalanta.—The least common of the local *Vanessas*. [Frequent in the suburbs of Constantinople.—P. P. G.]

V. cardui.—Generally common.

Melitaea cinxia.—Generally common. The larvae much in evidence on the ground towards the end of March, 1922. I bred imagines from these very easily.

M. trivia.—Not uncommon.

M. didyma.—Generally common. Appears a little later than *M. cinxia*.

Brenthis dia.—Locally common. Appears in June. [The June *B. dia* appear as a second brood. The first brood emerges in April.—P. P. G.]

Issoria lathonia.—One example taken by a friend 10 . 7 . 22. Appears to occur at Therapia. [Not uncommon at Therapia and in certain Asiatic localities in 1922.—P. P. G.]

Argynnis aglaia.—Locally common. Appears in June.

A. pandora.—Common at Therapia.

Melanargia galatea.—Generally common. On occasions one of the most abundant insects observed. [The Bosphorus *M. galatea* are a small form of race *turcica*.—P. P. G.]

Satyrus hermione.—No records available, but Riley identified a specimen sent as belonging to this species. [Occurs in Belgrade Forest. All "*hermione*" ♂s from Turkey which I have examined prove to be *syriaca* Stdgr. The genitalia leave no doubt on this point.—P. P. G.]

S. circe.—Generally common.

S. semele.—A number taken.

S. statilius.—Fairly common. [Constantinople *statilius* are of the race *fatuaeformis* Vty.—P. P. G.]

Pararge roslana.—One specimen taken by a friend at Therapia 16 . 7 . 22. No other seen at any time. [Very abundant in some years near Therapia and elsewhere in Constantinople in June.—P. P. G.]

P. megera.—Generally common. One seen 28 . 11 . 21 would appear a late record.

P. egeria.—Var. *egerides* not uncommon in its usual haunts.

Epinephele jurtina.—Generally common.

E. tithonus.—One or two examples only. [Locally in a few places in the Belgrade Forest district.—P. P. G.]

Coenonympha arcania.—Common in woods.

C. pamphilus.—Generally common.

Carcharodus altheae.—Not uncommon. [All Constantinople *altheae* in my collection (over 40 specimens) appear to be *orientalis* Rev., which may be a subsp. of *altheae*.—P. P. G.]

Hesperia sidae.—Locally common.

H. malvae.—Both this species and *H. orbifer* occur. It is regretted their relative frequency of occurrence was not investigated.

H. orbifer.—See under *H. malvae*.

Thymelicus flacus (thaumas).—Generally common. Larger and brighter than British examples. Appears in May. [Constantinople *thaumas* answer to Tutt's description of the southern race *iberica*.—P. P. G.]

Th. actaeon.—Not uncommon locally.

Agriades sylvannus.—One or two examples only. [Frequent in Belgrade Forest.—P. P. G.]

Heteropterus morpheus.—A few taken. [Very local near Constantinople.—P. P. G.]

[Note on Major Dick's captures.—Major Dick's list for the Mashlak area is interesting to me as I did practically no collect-

ing in this part of the Constantinople district in 1921 and 1922. I am glad to see that *L. arion* and *H. morpheus* have turned up there, but note with surprise the absence of *P. amandus*, which used to be frequent near Mashlak before the war, *E. cardamines* and *C. alceae*. The rarity of *P. roxelana* in 1921-22 is of interest. There are certain localities where one can always find this insect near Constantinople, while in others it occurs singly or not at all in some years and swarms in others. *I. lathonia* was regarded by me as rather a rare species near Constantinople till this year, when it turned up in some numbers in my garden and was frequent in the Alemdagh Forest.

Other species which occur near Mashlak are *H. dorilis*, which may have been overlooked, *Strymon* (*Nordmannia*) *acaciae*, which is local and very easily confused, unless examined, with *N. ilicis*, *Hipparchia briseis major* (rare), *D. paphia*, a straggler from the Belgrade Forest district, *Thais polyrena*, which I have only taken once, *P. maera orientalis* and *Hesperia armoricanus*. The last-named may have been confused by Major Dick with *H. malvae*, which, in my experience, is much rarer than *armoricanus* in the Constantinople region. I have been less successful in breeding *M. cinxia* from the larva than Major Dick. My efforts were brought to naught by hymenopterous parasites.—P. P. GRAVES.]

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

By F. C. BOWDITCH.

(Continued from p. 212.)

Galerucella bohiensis sp. nov.

Medium sized; stout, rich chestnut brown, with dark shoulders and a line of dark markings along the suture, the most prominent being two black dots on the declivity, before the apex; body below and legs entirely light brown.

Type: 2 Paraguay (Dr. Bohis). Length 4 mm. (Coll. Bow.).

Antennae short and stout, reaching just below the elytral base, 3 joint the longest; head rugosely punctate with a broad deep furrow on the vertex; surface of thorax punctate, with subangulate sides and three deep depressions, one on either side and one discal, the latter very broad, all more or less dark at the bottom; elytra with thickly punctate and pubescent surface; there is a faint depression on the outer disk; in the most distinctly marked specimen the three dark thoracic dots are well marked, also a long humeral dash, a spot next the scutel, a median dash next the suture and the rear spots placed obliquely before the tip; claws bifid.

***Galerucella elegans* sp. nov.**

Medium sized; body above and below pale, pearl grey; each elytron with three longitudinal dark greenish-yellow vittae, a sutural and median (united at the declivity), and a sublateral round the elytra from shoulder to shoulder; antennae black, reaching the middle of the elytra with basal four or five joints rufous, 3 joint the longest.

Type: 1 example, Reyes (Ecuador) 7 . viii . 93 (Stuart). Length 4 mm. (Coll. Bow.).

Upper surface thickly punctate and pubescent; head with well-marked longitudinal furrow; thorax with rounded sides and deep side impressions: those on the disk take the form of an hour-glass with extended base; the combination of colours on the elytra is very pleasing and delicate and is very different from any other species; the antennae are of the close-jointed type like *hebes* Erich. and show a tendency toward *Monocesta*; claws bifid.

***Galerucella difficilis* sp. nov.**

Medium sized; brown, picked out with tufts, and spots of darker colour; antennae short, barely reaching below the shoulder, 3 joint longest: each elytron with raised humeral and two basal median spots; a small sutural median and a large subapical spot; the latter is marked by a well-defined depression; looked at from the side these marks show as well-defined ridges and hollows, the apical depression being particularly prominent.

Type: 1 example Rio de Janeiro (Tijuca), 27 . vi . 89, also Brazil (Bruch). Length $3\frac{1}{2}$ –4 mm. (Coll. Bow.).

Entire upper surface punctate, obscured with pubescence; head with well-marked longitudinal furrow; thorax, looking from above, with three similar deep apical foveae; looking from the side there is a wide shallow semicircular median basal depression and immediately under its circular side edge a deep fovea; the elytra are uneven with the dark knobs and there are traces of several costae on the disk; there is also an ill-defined light band before the apical dark spots; body below and legs dark brown; claws bifid. The raised dark spots differ from any other species.

***Galerucella angulicollis* sp. nov.**

Medium sized; slightly dilated behind, like *terminalis* Jac.: colour black; thorax with an interrupted vitta on each side, and the base of the femora orange yellow.

Type: 2 examples, ♂ and ♀; Paraguay (Dr. Bohis). Length $4\frac{1}{2}$ –5 mm. (Coll. Bow.).

Antennae short, stout (analogous to *Godmani* Jac.), reaching below the shoulder, 3 joint the longest; head roughly granulate, longitudinally furrowed; thorax orange-red, not quite as rough as

the head, with side and discal depressions (marked with black), the sides angulate at the middle (notched in ♀); elytra rather finely but thickly and rugosely punctate with sparse fine pubescence; a very fine sutural edge smooth; thorax below and bases of femora reddish yellow; claws bifid.

(To be continued.)

NOTES AND OBSERVATIONS.

GYNANDROMORPHOUS PIERIS RAPAE.—In the *Entomologist*, liv, p. 201, 1921, I figured and described a gynandrous example of *Pieris rapae*, captured at Boxhill in 1891, and now in the collection of Mr. D. C. Johnstone. Through the courtesy of Mr. G. B. Coney I am now able to record a second example of this species exhibiting complete gynandromorphism, the left side ♂ and right side ♀, the normal colouring and markings of both sexes being well developed. On the ♂ upper wing is a slight dusting of black scales (about thirty in number, clustered together), indicating the lower central spot of the ♀. The left antenna and palpus are those of a ♂ and there is a well-developed clasper on the left side. Apparently the sexual structure is equally divided down the centre of head, thorax, and abdomen. Mr. Coney captured the specimen on August 9th last in his garden at Batcombe, Bath, and has kindly lent it me for the purpose of figuring and describing.—F. W. FROHAWK.

COLIAS CROCEUS.—I saw one male *C. croceus* on September 13th, when out shooting—the only one I have seen this year. Butterflies generally have been scarce; the Common Whites not numerous; a few *atalanta* and *urticae* in the garden, but fewer than usual.—WALDEGRAVE; Chewton Priory, Chewton-Mendip, Somerset.

[*C. croceus* seems to have been very little in evidence this year. I have only heard of it from Folkestone, S. London, Essex and the Scilly Isles.—N. D. R.]

ARGYNNIS LATHONIA IN SOMERSET AND HANTS.—I caught a ♂ specimen of *A. lathonia* on June 29th this year at Sharpham in Somerset. A few days later a friend of mine took 2 specimens of *A. lathonia* var. *tractipedula* (on the same day) at Petersfield in Hampshire. Mine was flying over a marshy field, and there was a lot of the food-plant in the vicinity.—J. M. JAKES; The Red House, Banstead, Surrey.

POLYGONIA C-ALBUM IN BEDFORDSHIRE.—I caught a male specimen of the Comma butterfly (*Polygonia c-album*) in the garden of this house, which is situated on the northern outskirts of Bedford, on the afternoon of September 7th. The specimen was quite perfect and was taken while sitting on the grass.—H. A. N. TEBBS; 33, Kimbolton Road, Bedford.

POLIA CHI: NEW TO GLOUCESTERSHIRE.—I wish to record the capture of 18 *Polia chi* on some walls between Downend and Frenchay near Bristol this year, the first on August 18th, 3 on the 21st, 2 on the 25th, 2 on the 26th, 1 on the 28th, 1 on the 30th, 4 on the 31st, 2 on September 2nd, 1 on the 4th, and 1 on the 6th. I inquired of the Secretary of the Bristol Field Club, Mr. H. Womersley, if they had

been found before in this district. He sent the inquiry on to Mr. Griffiths, the recorder of the club and a very experienced entomologist, and I herewith enclose his reply, which was kindly sent on to me. Among the 18 there are no variations except that some are slightly darker than others, but they are all perfect, and correspond with figs. 2 and 3 on Pl. 138 of R. South's Moths of the British Isles.—A. KROMER; 45, Summerleaze, Hillfields Park, Fishponds, Bristol.

The record of *P. chi* is interesting; there is certainly no previous one for Gloucestershire. I find in Hudd's M.S. notes, which I have, that J. Mason, of Clevedon, recorded two there in 1884; he also took it in 1885 and '86; also Mr. C. Sargent took it at light in 1884. Hudd adds a pencil note, "Bath" (no date), and "abundant in Dartmoor Dist., Devon." Barrett says Somerset and Devon but no other southern county. I have only found it on walls near Bradford, Yorks.—GEO. C. GRIFFITHS; 3, Leigh Road, Clifton, September 1st, 1923.]

FOOD-PLANT OF *CIDARIA TESTATA*, ETC.—Had your correspondents, Messrs. Melrose and Peach (*Entom.*, July, 1923, p. 214) pursued their investigations a little further into entomological literature, they would have found that *Calluna vulgaris* has long been known as one of the food-plants of *Cidaria testata*. Buckler figures the larva as "on heather, Scotland," and Meyrick gives *Calluna* as one of its foods. Here we have always regarded *Calluna* as the food of the species. It is very abundant on all our moorlands among *Calluna*, usually where not a vestige of sallow or birch or of any other tree is to be seen, its numbers indeed being only equalled among the Geometrae out at the time by perhaps *Hyssipetes sordidata* and *Larentia didymata*. I am pretty sure that I have also seen the larva feeding on bilberry—anyway, the moth is abundant enough among that plant, but as both it and heather usually grow together, without direct evidence to the contrary it is of course possible that all the larvae may have fed on the heather. I have never seen the larva on sallow here, although we have plenty of it, but I have done so in other districts. The species is very abundant on the Lancashire coast sandhills among dwarf sallow, on which its larva no doubt feeds. So far as I remember I have never seen it on birch anywhere, although in some of our woods in many parts birch is the dominant tree. But unless such woods also contain an undergrowth of heather and bilberry, we don't see *testata* in them. Our specimens of the moth are of the dark purplish-brown form, and we never see the bright yellow form var. *achatina*, which occurs at Wicken, Colchester, and no doubt other places in the south of England. The var. *insulicola*, which I believe has not hitherto been recorded as occurring south of Scotland, is not uncommon here. On the other hand, of *Cidaria populata*, so closely allied to *testata*, which a month earlier on the same ground is as abundant here as is *testata* later, we find only the ordinary pale forms. I have never taken here anything like the very dark unicolorous var. *mensuaria* which occurs commonly at Rannoch, and this brings us up against one of the many anomalies which make it so difficult to formulate any theory to account for melanism in Lepidoptera.—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, September 7th, 1923.

Food-plant of *Cidaria testata*.—In this district (East Tyrone) two forms of this species occur—the mountain and bog form (purplish

grey), and the marsh form (reddish grey). The larva of the former feeds almost exclusively on heather (*Calluna vulgaris*), the latter on willow.—THOMAS GREER; Stewartstown.

Food-plant of Cidaria testata.—With reference to Messrs. Melrose and Peach's note *re* food-plant of *C. testata*, I have several times taken the larva on heather, *e.g.* on July 13th, 1896, and reared it on that food, though in the locality (Haldon near here) birch and willow also grow. I may say I have always myself looked on heather as its natural food-plant. — E. F. STUDD; Exeleigh, Starcross, Devon.

WHAT IS THE FOOD-PLANT OF YPONOMEUTA IRRORELLUS? A few weeks ago when looking on a fence for small fry I met Mr. W. Pascell, of Manor Park. In the course of conversation I happened to speak of the abundance of *Y. cognatellus* Hübn. He remarked that he once bred, a good many years ago, a single specimen of *irrorellus*. This was interesting, but something more so was to come. He told me that he bred it from a larva feeding in a web on the young green fruit of "Cow parsley" (*Anthriscus sylvestris*). This was indeed a startling piece of information, so on the first opportunity I went to have a look at it, half thinking some little mistake with regard to the species had been made. The drawer was produced, and surely enough there was a fine *irrorellus*, and in addition a sprig of the food-plant with the pupa case in its web *in situ*. That the larva had actually fed on this, to me, extraordinary food-plant there can be no doubt, because many of the green fruit had been gnawed. It was found at the beginning of June, 1878, in the Dartford district, but although so many years have passed, it had vanished I think from its one British locality even before that date. Can it be that after all we may have been misled (as to its real food-plant), intentionally or otherwise, by those who used to get it at Wandsworth in the fifties and early sixties of the last century? It is a far cry from *Euonymus* to *Anthriscus*! Nevertheless it is interesting to notice the diversity of food-plants selected by the closely allied members of this genus *Euonymus*, *Prunus*, *Crataegus*, *Salix* (*irrorellus*), *Sedum*, *Erica*, etc.; so perhaps *Anthriscus* will have to be added to the list, which I hope, all being well in June, I may be able to do.—A. THURNALL; Wanstead, Essex, September 5th, 1923.

LACTUCA MURALIS A FOOD-PLANT OF *PSELNOPHORUS BRACHYDACTYLUS*.—As some doubt exists as to the actual food-plant of *P. brachydactylus* in this country, it may be of interest to learn that on August 26th I succeeded in finding the larvae on some plants of *Lactuca muralis* in a wood near this town. Subsequent search there proved they were not uncommon, but restricted to a very limited area. Up till September 4th larvae were met with in their first instar, though when first discovered it was evident that many had left the food-plant for hibernation, and of those brought home the majority had also reached that stage, well known to myself, through having reared the species from ova some couple of years ago. The eggs are laid on the underside of the leaves, generally singly, but sometimes as many as two or even three are placed close together.—W. B. DAVIS; 3, Rosebank Villas, Churchfield Road, Stroud, Gloucester, September 8th, 1923.

PIERIS BRASSICAE WITH A LARVAL HEAD.—I have thought it might be of some interest to biologists to record that on May 7th, 1923, as my brother (J. P. Benson) was walking up Park View Road, Berkhamsted, he saw a ♂ specimen of *Pieris brassicae* fluttering a few feet above the road. Owing to its strange heavy flight he caught it in his hand, and on examination it proved to have a larval head. I have the specimen: it is in quite good condition, but unset. I am aware that a specimen of *Pyrameis atalanta* with a larval head was exhibited at a meeting of the Entomological Society of London on November 16th, 1921.—R. B. BENSON.

A Sawfly flying round a Light at Night.—At 9.30 p.m. on the night of August 21st, 1923, I caught a ♂ specimen of *Cladius pectinicornis* flying around and occasionally settling on an oil-lamp in a house at Crowcombe, Somerset. I have never previously heard of or seen a sawfly being attracted by light at night, and would be interested to know if there are any previous records of this.—R. B. BENSON; Boldre House, Berkhamsted.

LEPIDOPTERA OF THE SOUTH SALISBURY DOWNS, 1923. The following notes of Lepidoptera collected around the village of Damerham during the season 1923 may be of interest. The most striking event was the occurrence of *Polygonia c-album*, on August 8th, which was seen on a scabious flower-head. Although I had the net over it, it escaped, and further search was not attended with success. I have collected in this locality since 1909, but have no previous record of *P. c-album* occurring.

Pieris rapae and *Aglais urticae* were first seen on 1st April and *Gonepteryx rhamni* on the following day. During the season nothing was seen of *Eugonia polychloros*, but *Pyrameis atalanta* and *P. cardui* were more abundant than usual during August. *Argynnis paphia* was also quite common on the downs, but *Brenthis euphrosyne* was quite scarce, although it usually occurs in fair numbers. *Hipparchia semele* has quite re-established itself, and *Pararge megera*, *Epinephele jurtina* and *E. lithonus* literally swarmed. Only a few specimens of *Aphantopus hyperanthus* were seen. *Zephyrus quereus* persisted until the middle of August. *Plebeius corydon* was very common in early August, and there appeared to be a larger proportion of females than usual. *Plebeius thetis*, which seems to vary very much in abundance, was relatively scarce. A second brood of *Zizera minima* was in evidence in early August and *Argiades comma* is decidedly on the increase. *Orgyia antiqua* was observed as early as 13th August. *Taenioicampa miniosa* was taken at light on 4th April. *Charaxes graminis* has quite established itself in the locality, but of *Cucullia verbasci*, although the larvae usually abound, very few were seen this season. A colony of *Zygena filipendulae* has dwindled during the last few years and very few were taken this season. In an area within 5 miles of the village of Damerham I have now taken or seen or have definite records of 45 species of Rhopalocera.—A. STEVEN CORBET; Abbey Stone House, Sidmouth Street, Reading.

VARIATION IN LEPIDOPTERA. In his rejoinder to my letter on this subject Dr. Butler really breaks little fresh ground, most of it being occupied by his interesting exposition of the origin of bright colours, which, however, he appears to attribute almost entirely to

sexual selection. Apparently he does not contest my main argument that, judging by analogy from other orders, reversion is wholly unsatisfactory as a means of accounting for black, white and pied varieties—his original contention. He now merely argues that brighter colours were produced by sexual selection from a darker stock, which, if proved, must knock his original theory on the head once and for all, as presumably the process of selection is still going on, and therefore species should grow brighter and brighter, and not revert darker and darker, unless, of course, we are to understand that the sight or æsthetic sense of female Lepidoptera is deteriorating. As regards the fading of pigmental colours Dr. Butler seems to have missed my point. Though the colours of *Neorinopsis sepulta* may be quite as sharply defined and distinct as in any living species, my whole argument was as to what grounds for certainty we have in regarding those colours as the original ones? When a highly-coloured species, say *Arctia caja*, fades, it fades uniformly, so that it presents just as definite a pattern of white, pale brown, cream and dark brown as it formerly did of cream, dark brown, red and black. I for one would not care to say what the original colours of a well-preserved faded specimen were if I had not already seen a fresh example, and I cannot regard the white sandstone of Aix-en-Provence as an ideal cabinet for entomological specimens. As Dr. Butler rightly says, in the dark females cannot exercise much choice in selecting mates, yet what more exquisitely coloured insects have we in the country than *Chaerocampa elpenor* and *porcellus*, which fly at late dusk when colour is at a discount; and these examples could be multiplied *ad nauseam*. Again, in the insects that fly after dark everyone must have noticed the tendency in certain genera to brilliant colouring of the posterior wings, of which the genera *Triphaena* and *Catocala* may serve as examples. Sexual selection obviously cannot explain these, and if lighter posterior wings, rendering the insect slightly visible in the night, were an advantage, surely the pearly under-wings of many Noctuidæ would fill the bill with greater success. It looks in these cases as if the anterior wings had been modified for greater safety at rest, leaving the original colours in the posterior wings, where modification was unnecessary. The theory of sexual selection is clear as daylight, but its practical details are very puzzling to the outdoor naturalist. Forty years ago it was easy to explain everything: insects had been modified by (a) natural selection or (b) sexual selection. If they were still refractory and would not walk two by two into either of these arks of refuge, they exhibited "warning colours" or were otherwise ingeniously accounted for. But while anyone can, I think, admit that even a slight degree of protective resemblance might be of such an advantage as to have a definite survival value, in the case of a group with the admitted weakness of sight of the Lepidoptera how could the beginning of a bright colour be advantageous? In the past few weeks I have been observing paired specimens of *Agriades thetis* with a view to this problem, and of nine pairs two of the males were fresh and brilliant, three indifferent (the sort of insect called "fair" in exchange notices), and four had scarcely any brilliant colour at all. When I saw these there were plenty of brilliant males about, so quite obviously the females do not care much about degrees of brilliance in colour. I

take it that the hypothetical original male *thetis* had a coloration somewhat like the present-day brown female, and according to theory sexual selection made it the wonder that it is from a slightly blue-streaked example. If my observations go for anything at all, the females would not have taken a scrap of notice of small blue streaks in the beginning, and the selection would never have begun. Of course if we conjecture that an altogether bright blue sport appeared suddenly I can concede something to the argument, but this was not Darwin's theory of sexual selection, and does not explain the cause of the sudden blue apparition. So far as I can see, female moths pair more with worn and faded males (quite apart from the different emergence times of the sexes) than with fresh ones, presumably because the former are greater experts in jostling others out of the way and get to business sooner.

I have been emboldened to make these lines public by seeing that Messrs. Porritt, Sevastopoulo and Wynne have all apparently felt the same doubts on the subject, which has puzzled me for some time. —H. C. HUGGINS; Oldestede Cottage, Chestnut Street, near Sittingbourne.

REVERSION TO ANCESTRAL COLOURING. —My critics have wandered away from my original point that colouring in animals was originally either black, brown or white, to the various causes of reversion to those hues. Long before my late friend Bonhote wrote his book *Vigour and Heredity*, I had pointed out that melanism was an evidence of a vigorous and albinism of a delicate constitution, that some birds, after losing feathers while fighting or from attacks by more powerful males during the breeding-season when their strength was at its highest, reproduced them of a black colour, though previously they had been brown or even pure white, the normal colouring being resumed at the next moult; also that vigorous birds often became much blacker in old age, whereas delicate ones often became pied with white or thin black markings changed to buffish yellow.

In birds and in birds' eggs melanism appears to be produced by moist heat. Mr. Wynne suggests that in *Lepidoptera* moist cold combined with the necessity for protection may have a similar effect; if so, the need for preserving the life of the species must be far more powerful in its action than the necessity to retain its full vigour, for one can hardly suppose that moist cold, which is destructive to many animals, would invigorate insects.

I very much doubt the weakness of sight in *Lepidoptera*: in fact if one watches the lightning-like flight of the *Sphingidae* and especially of *Macroglossa* (as also of *Plusia* and many other moths) it is simply incredible. Undoubtedly they appreciate colour, as anyone may see if he watches even our common cabbage-butterflies retiring to rest at night—indeed, very many of the *Lepidoptera* choose protective backgrounds on which to pass the night. The fact of a male butterfly or day-flying moth being more or less imperfect, whilst it renders it much less attractive to an entomologist, does not of necessity detract from its beauty in the eyes of a female of its own species, who is sensitive only to its colouring. It is a common mistake, but a very illogical one, to suppose that other animals see

and think exactly as we do; many human beings have a horror of spiders, but birds prefer them to any other food as a general rule.

Brightly-coloured moths like our Emperor are as a general rule day-fliers, or, if not, have close relatives which still fly by day; thus, although *Arctia caja* rests in the daytime, its relatives *hera*, *dominula*, *plantaginis* and *fuliginosa* are all day-fliers; though the species of *Catocala* with red or bright ochreous hind wings are night moths, the related *Endromis* flies by day, and it may be (though I do not know whether or no such is the case) that the beautiful *Catocala nivea* from Japan, with its black-banded, creamy-white hind wings, differs in this respect from its congeners. The fact that a brightly coloured insect now flies by night is not evidence that its progenitors did the same.

A study of the Lepidoptera of the world shows that even now the majority still retain the colourings which I claim to have been ancestral—black, brown or white; the whole of the *Euploeids*, a large group of genera related to *Danaida plexippus*, and its allies are black, brown and white, many of them shot or spotted with blue, purple or lilac; the large genera *Athyma* and *Neptis* related to our White Admiral are black banded with white and with ochre or red-brown bands on the under surface; many of the *Papilionidae* are black and white; most of the *Pieridae* are white or yellow, other colours such as orange, scarlet, or rarely bluish-grey being doubtless assumed for protective purposes, rendering them inconspicuous when at rest upon bright flowers, fading leaves, etc; it is significant that these colours are mostly assumed by the females, which, of course, need protection more than their mates.—A. G. BUTLER.

RECENT LITERATURE.

Annual Reports lately to hand are:—

- (1) *Christ's Hospital, West Horsham, Natural History Society, 20th Annual Report, 1922.*

THE report of the Entomological Section (pp. 15-19) shows that several fresh species were added to local list in spite of the unusually bad season; a great number of seasonal records made; and a total of 260 species reported altogether, almost entirely during school term. The stimulating influence of the Section's President accounts for a good deal of these results; it is a pity more attention is not devoted to the Micro-Lepidoptera, amongst which much useful work remains to be done.

- (2) *45th and 46th Annual Reports and Proceedings of the Lancashire and Cheshire Entomological Society, 1921-1922. Pp. 100, 1 plate, 1923.*

THE most valuable papers contained in this volume are the Preliminary List of the Aphididae of N. Wales, by F. V. Theobald and C. L. Walton, containing the description of several new species; and the continuation of the Lancashire and Cheshire List of Lepidoptera by Wm. Mansbridge, of which a further 16 pp. (Noctuidae) are here published. The institution of money prizes for exhibitions and

essays on set subjects is an interesting new feature well calculated to stimulate interest in Entomology.

(3) *Proceedings of the South London Entomological and Natural History Society, 1922-23.* Pp. xviii + 152, 8 plates, 1923.

PRE-WAR standard seems to have been reached again in this volume—sufficient testimony to the vigour of the Society! The Brief Review of the Indigenous Coccidae of the British Isles by E. E. Green is an able and very useful paper—brief it may be, but it is certainly also concise. W. J. Lucas contributes an excellent paper on The Labium of the Paraneuroptera, whilst R. Adkin on *Diacrisia mendica* and on The Lepidopterous Enemies of Man, T. H. L. Grosvenor on The Genus *Zygana* and W. S. Bristowe on The Spiders of Oxshott all make most interesting reading.

(4) *Transactions of the Carlisle Natural History Society.* III, pp. 107, 1923.

OF the three papers contained in this volume, two are of direct interest to Entomologists. Part III of G. B. Routledge's List of the Lepidoptera of Cumberland occupies 30 pp. and deals with the whole of the Geometridae. Some 200 species are definitely recorded, and a list of 23 doubtful records appended. Local lists such as this, in which the merits of all the records are carefully weighed and considered, are invaluable. The other paper is the concluding portion of F. H. Day's List of Coleoptera of Cumberland, to which the same remark applies. This list brings the total of recorded species up to 1797.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*July 26th, 1923.*
—The President in the Chair. Mr. F. S. Windsor, Oatlands Cottage, Horley, Surrey, was elected a member.—The President exhibited a gynandromorph of *Polyommatus icarus* from Martigny, Switzerland, right half ♂, left half ♀; Mr. Jacobs a specimen of *Cemiostoma laburnella* and a Homopteron quite like it in facies and occurring with it on Laburnum; Mr. Withycombe a young ♂ of *Chirocephalus diaphorinus* bred from the egg; Mr. Turner living examples of the case-bearer, *Coleophora troglodytella*, bred from *Iuula dysenterica*. Lyme Regis, Dorset; Mr. Barnett ab. *schmidtii* of *Heodes phlaeas*, ab. *obsoleta* of *Aricia medon*, and an extreme blue form of female of *Polyommatus icarus*, all from Surrey; Mr. Edwards a fine, very fern-like dendrite on a flint from Salisbury Plain; Mr. Step the cast skin of the Smooth Snake from Studland, Dorset; Mr. Dennis sub-species *amethystea* of the broom-rape, *Orobanche minor*, grown in Chelsea Physic Garden on roots of Sea-holly, *Eryngium maritimum*. —HY. J. TURNER, *Hon. Editor of Proceedings.*

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THE LEPIDOPTERA OF THE MADEIRA ISLANDS.*

By T. D. A. COCKERELL.

THE Madeira Islands, consisting of Madeira, Porto Santo, the three Desertas and a number of small islets, are between three and four hundred miles out in the Atlantic, off the west coast of Morocco. The superficial area of Madeira is said to be about 245 square miles; the other islands are much smaller. Owing to the warm, equable climate and the rich volcanic soil, it is possible to grow an enormous number of different woody plants, which develop to perfection in the gardens. I visited the garden of Mr. Chas. O. L. Power in Funchal and obtained a catalogue of the trees and shrubs, nearly all of which I personally examined. It seems probable that there is no other place in the world where so many genera are to be found in such a small area. There are, for instance, fifty-six species of palms, twelve species of tree-ferns (nearly all grown from spores), nine different cycads, and species of *Araucaria*, *Bombax*, *Bigonia*, *Crescentia*, *Cinnamomum*, *Eugenia*, *Eucalyptus*, *Erythrina*, *Ficus*, *Tamarindus*, *Sterculia*, *Grevillea*, etc., etc.

In the face of all this it is astonishing to learn that the recorded Lepidoptera, after all the investigations of Wollaston and others, number only about 170 species. Of these, only 13 are Rhopalocera, 5 Sphingidæ, 1 Arctiidae. There are 31 species of Noctuids, 18 of Geometrids. Among the butterflies, the skippers, *Papilio*, *Melitaea*, *Coenonympha*, *Euchloë*, *Aglais*, *Limenitis* and many other familiar genera are wholly absent. The Lycaenidae are represented only by *Chrysophanus phloreas* and *Polyommatus boaticus*. There are no Sesiids or Cossids, nor any Psychidae. The poverty of the Lepidopterous fauna, considering the climate and physical features generally, is extraordinary. Yet the Coleoptera are numerous, with many endemic species, and indeed a considerable series of endemic genera.

After reviewing the matter from every angle, and taking into account the entire fauna and flora, as well as the geology,

* I am greatly indebted to Mr. J. H. Durrant for the names of the Microlepidoptera I collected, and for showing me the specimens on which Lord Walsingham based his account of the Pterophorids, Tortricids and Tineoids of Madeira. Dr. H. Rebel, in Ann. K. K. Nat. Hofmuseum Wien (1917), has published the latest and standard list of Madeira Lepidoptera.

marine soundings, etc., I have no doubt that the islands must be regarded as "oceanic." That is to say, they have never been connected with the mainland. The Desertas were evidently once connected with each other and with Madeira, but Porto Santo and Madeira are separated by deep sea, and presumably were never united. Mollusca and other animals may have crossed from Porto Santo to Madeira, or *vice versâ*, partly on floating dragon-trees (*Dracæna*), which formerly grew abundantly near the shore. These trees branch above, so that some of the heads of leaves would probably rise above the water, and at their bases many small creatures might find lodgment. Many years ago I examined some young date palms received at Washington from N. Africa, and the number of species of the N. African fauna, Insecta, Mollusca and Chilopoda was amazing. A single tree might contain a dozen species, but a floating palm would doubtless be entirely drenched by salt water. Many flying insects could of course cross the 23 miles between Madeira and Porto Santo in the air.

Assuming that the islands have always been some hundreds of miles from the continent, how did they get their insect-fauna? The hundred-fathom line runs very close to the coast of Morocco, so we cannot well postulate much extension of land from that direction. Probably the insects, or their ancestors, all arrived in one of the following ways:

(1) By flight. At certain seasons a very strong hot wind blows from Africa, and insects have been actually observed to arrive at such times. Probably many of the stronger-flying Lepidoptera thus reached the islands, and it is significant that the list includes several which are well known to migrate or take long flights, such as *Pyrameis cardui* L., *Plusia gamma* L., *Heliothis obsoleta* Fab., *Leucania unipuncta* Hw., etc. Burr mentions that he saw in the collection of the Seminario at Funchal, presumably collected in Madeira, *Colias hyale* L., *Danaus archippus* Fabr. and *Hypolimnus misippus* ab. *inaria* Cram. These are migratory forms, and, so far as we know, have not become established in the islands.

(2) On migrating birds, or birds accidentally reaching the islands, of which a large number has been reported. I have discussed elsewhere the probability that Coccid larvae may have arrived in this manner, but it seems unlikely that any Lepidopterous insect could be so conveyed.

(3) On floating objects, such as trees. Dr. D. S. Jordan mentions that when crossing the Pacific the man on the watch detected what appeared to be a Japanese boat, with two occupants. The ship went out of her course to rescue these men, only to discover a pine tree with two branches directed upward. Such objects may well carry sedentary insects, such as certain Coleoptera, but would not often cross the sea with Lepidoptera.

It may be for this reason, largely, that the Coleoptera are relatively better developed on the Madeiras than the Lepidoptera.

(4) By human means, with plants or merchandise, or accidentally on ships. I am convinced that a very large proportion of the present fauna of the Madeiras was introduced by man during the hundreds of years of occupation. It is not always easy to distinguish clearly this element in the fauna, and hence confusion results. The American *Cosmopteryx pulcherrimella* Chamb., recorded by Walsingham, must certainly have been introduced. It is, however, well established, for I took it at Funchal, Dec. 31, 1920. Not so clear is the case of *Cobalos dubiosus* (Baker), an apparently endemic species of an American genus. (I write *Cobalos* Smith, instead of *Cobaliodes* Dyar, because the former is not, I think, invalidated by *Cobalus* Hbn.)

Aside from the obstacles to arrival on the islands, there is another serious difficulty caused by the poverty of the indigenous flora. Now that so many kinds of plants are cultivated, we may expect the Lepidoptera to increase rapidly through casual introductions. But the native flora contains no species of *Abies*, *Acer*, *Alnus*, *Betula*, *Calluna*, *Carpinus*, *Clematis*, *Cornus*, *Corylus*, *Crataegus*, *Eupatorium*, *Fagus*, *Fraxinus*, *Humulus*, *Larix*, *Ligustrum*, *Lonicera*, *Pinus*, *Primula*, *Prunus*, *Pyrus* (but *Sorbus* is present), *Quercus*, *Ribes*, *Rosa* (probably none native), *Solidago*, *Syringa*, *Taraxacum*, *Tilia*, *Ulmus* or *Vitis*. Imagine the effect on the British fauna if all these plants were somehow removed. It is true that Heer reported fossil *Corylus* and *Ulmus* from Madeira, but Lowe declared that they were only leaflets of *Rubus*. Putting the matter another way, the average immigrants, members of the Palaearctic fauna, would probably find little sustenance in the native *Dracaena*, *Sideroxylon*, *Clathra*, *Persea*, *Ocotea*, etc., though they might feel at home in the presence of the native species of *Berberis*, *Silene*, *Ilex*, *Lotus*, *Sambucus*, *Artemisia*, *Erica*, *Vaccinium*, *Urtica*, *Salix*, *Juniperus*, etc. On the whole, ability to arrive was by no means the only thing necessary for establishment.

There are no endemic Sphingidae or Arctiidae; indeed, the only Arctiid is *Deiopeia pulchella* L., which I collected at Funchal many years ago, on May 3, 1879. The six butterflies which have been regarded as endemic are:

Pieris brassicae var. *Wollastoni* Butler. A darker insular race, approaching the Canarian form *cheiranthi*. According to Röber practically the same form occurs at Smyrna.

Gonepteryx maderensis Felder. An insular derivative from *G. cleopatra*, approaching the Canarian *cleobule* Hb.

Pyrameis indica occidentalis Felder. An isolated race of an Asiatic species, but with a very closely related form (*vulcanica* Godt.) in the Canaries. Occasional specimens have been taken in Portugal.

Satyrus semele madarensis Baker. Not represented in the Canaries, but doubtfully reported from the Azores, where named *azorinus** Streck.

Pararge xiphia Fabr. Common; I saw it at Funchal and Machico. Apparently a good species, though sometimes treated as a subspecies of *P. aegeria*. The related Canarian form is *xiphioides* Stgr.

Chrysophanus phlaeas var. *phlaeoides* Stgr. A dark form, but Seitz says that even darker ones occur near Lisbon, while a specimen taken by my wife at Porto da Cruz, Madeira, is ordinary *phlaeas*, not dark at all.

In all this series there is nothing radically distinct, such as we find among the Mollusca and Coleoptera; but the amount of differentiation shown suggests that some of the forms, at least, reached the islands prior to human occupation, possibly in Pleistocene times.

The Noctuids and Geometrids include a fair number of endemic species, mostly known by single or few specimens taken long ago by Wollaston. *Chutapha wollastoni* (Baker) is variable, and one form has been named *derufata* Warren. Some forms of this were considered by Baker as belonging to the American *C. periculosa* and its variety *v-brunnea* Grote. *Bryophila simonyi* Rghfr. is confined to the Canaries and Madeira; while the variable *Cosymbia maderensis* (Baker) is found in these islands and the Azores. *Eriopus latreillei* (Dup.) in Madeira, according to Bethune-Baker, has a pretty rosy suffusion—the more noteworthy because a tendency to this colour is common among Madeiran moths. It would seem to deserve a varietal name, but it may be the var. *roseitulum* Walker, described from the Congo. The Geometrid genus *Ptychopoda* has no less than three endemic forms in Madeira. The *Pyralsids*, catalogued by Bethune-Baker, include a few endemic species. Wollaston named a *Crambus atlanticus*, which abounds at middle and high altitudes in Madeira. *Nomophila noctuella* (Schiff) is of course present, being a migratory, almost cosmopolitan species. The Tortricids and Tineoid families were elaborated by Lord Walsingham, so far as the available material permitted. He also listed the few Pterophoridae. The material I obtained in 1920-21 permits the following records:

Platyptilia brevipennis, Zeller. Funchal, Dec. 29 (Fred. Jones). A widely distributed species, new to Madeira.

Apatema fasciatum Staint. Funchal, Dec. 29 (F. Jones). New to Madeira. Known from the Canaries, Tangier, etc.

Cosmopteryx attenuatella Walk (*flavofasciata* E. Woll.).

* I do not know why Professor Cockerell should doubt this record. There are absolutely authentic specimens in the British Museum (Nat. Hist.) from the Azores.—N. D. R.

Funchal, Dec. 30 (F. Jones). New to Madeira, but very wide spread; Canaries, St. Helena, West Indies, United States.

Blastobasis lavernella Wlsm. I bred this from a pupa found at Funchal; emerged Jan. 12. Endemic. The genus *Blastobasis* is remarkably rich in endemic species in the Madeiras.

Pinaris (or *Depressaria*) *perezi* Wlsm. At light at Funchal. Also in Canaries.

Tinea fuscipunctella Haw. Funchal, March. New to Madeira but known from Canaries.

Hieroxestis subcervinella (Walker). Funchal, March 3 (Mary and Peggy Davis) and March 4 (Cockerell). Very widely distributed; Seychelles and Mauritius specimens are in British Museum. Mr. Durrant says that *H. sanctae-helenae* (Walk.) appears to be the same.

H. praematura Meyrick? Common at Funchal; I obtained a long series. Evidently a recent introduction. Mr. Durrant was not quite sure that it was Meyrick's species.

There was also a *Blastobasis*, Funchal, Jan. 31, identical with an undetermined species in the Walsingham Collection, and presumably undescribed.

The Lepidoptera of the smaller island of Porto Santo are very little known. I collected *Xylina exoleta* (L.) at Villa Baleira in January. The common *Plodia interpunctella* (Hb.), previously known from Madeira, I found in Porto Santo. The following were identified by Mr. Durrant.

Trichophaga abruptella (Woll.) (*bipartitella* Rag.) Villa Baleira, January. Also in Madeira and N. Africa, and previously known from Porto Santo.

Euscelis maderae (Woll.). Pico d'Anna Ferreira. Known from Madeira and Canaries.

Stenoptilia bipunctidactyla Scop. North of Villa Baleira, two specimens, January. New to Madeira Is.; known from Canaries, etc.

Lita portosanctana (Staint.) is the only endemic moth of Porto Santo, as the records now stand. *Lita pulchra* (Woll.) appears to be endemic in the Desertas.

In concluding, I would earnestly beg lepidopterists to explore the Madeiras while there is still a good chance to find peculiar species and races, especially in the high mountains and smaller islands. The native flora is giving place to innumerable introduced species, and the native Lepidoptera must certainly tend to diminish or disappear. There are few places so interesting to the scientific naturalist, and it seems to me that the fascinating character of the problems involved amply makes up for the relatively small collections which may be obtained. The fauna, as will be seen from the above, is entirely Palaearctic, except for certain introduced species.

PERONEA HASTIANA, L. : ITS DISTRIBUTION, HABITS,
LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 226.)

(53) ab. *ramostriana* Stephs.

Synonymy.—Stephens, *Haust.* iv, p. 154 (1834); *Id.*, *Cat.* ii, p. 186, No. 7063 (1829); Curtis, *Brit. Ent.* 1st edn., 16, No. 27 (1824); *Id.*, *Guide*, 1st edn., p. 174 (1829); *Id.*, *Guide*, 2nd edn., p. 202 (1837); Wood, *Index Ent.* No. 1066 (1839); Westwood, *Brit. Moths*, vol. ii, pl. xciii, fig. 11, and p. 157 (1845); Snellen, *Vlind. Ned. Micr.* p. 177 (1882); Barrett, *Brit. Lep.* pl. ccccliii, fig. 1c (1905); Meyrick, *Gen. Ins.*, fasc. 149, p. 65 (1913).

Original description.—Anterior wings pale testaceous brown, with numerous darker streaks radiating from a palish central line; posterior wings whitish brown; thorax and head whitish (Stephens, *l.c.*, 1834).

This aberration is another that apparently was well known many years before it was described, for Curtis, in 1824, alludes to it as a manuscript name of Haworth's. Curtis, however, does not describe it, and although it was evidently well known to contemporary lepidopterists, it was finally stabilised by a description being given to it by Stephens.

Unfortunately the type-specimen of this form is also missing from the British Museum Collection. We must therefore diagnose it from Stephens' description, and Wood's figure, which fortunately is a good one.

Ab. *ramostriana* is, so far as my knowledge goes, exclusively of southern distribution, and is by no means common. I have examples from Kent, Isle of Wight and Wicken.

Striana Group.

In this group the whole of the veins of the superiors are thickly clothed with scales darker than the ground-colour. They are without a vitta.

(54) ab. *striana* n. ab. (Plate 2, fig. 17.)

The characters of this striking aberration can best be grasped by reference to the figure. The ground-colour of the superiors, head and thorax is pale straw colour, and the dark longitudinal striations are fuscous.

Ab. *striana* is another of the southern forms, common at Wicken, and in a Kentish locality: I have specimens also from Wimbledon and the Isle of Wight. The type is from Kent.

(55) ab. **maculostriana** n. ab. (Plate II, fig. 20.)

Similar in all respects to the last, except that it has the triangular costal blotch found in many *hastiana* forms, and traces of the usual pale transverse striga with dark margins. It is another southern form, not by any means abundant. The type is a Wimbledon specimen; I have others from Kent and Wicken.

(56) ab. **ustulana** n. ab. (Plate II, fig. 18.)

Synonymy.—Kennel, Pal. Tort. pl. iii, fig. 42, and p. 72 (1908) (*aquilana*); Spuler, Schmett. Eur. vol. ii, p. 241 (1910) (*aquilana*).

Similar in all respects to ab. *striana*, except that the colour of the superiors is a reddish brown, the head and thorax being pale straw colour.

Ab. *ustulana* is not uncommon; my type came from Wimbledon, and I have other examples from Kent, the Isle of Wight, Wicken, and Morpeth. I have not seen specimens from Scotland.

(57) ab. **substriana** n. ab. (Plate II, fig. 19.)

This is another aberration similar in all respects to those in the group previously described, with the exception of the colour, which is a very dark dusky brown.

The type is from Lochinver, and I have examples also from the Isle of Wight and Wicken; the form is rare.

Radiana Group.

Forms similar to those in the last group, but having a pale costal vitta not found in the *striana* group.

(58) ab. **flavana** n. ab. (Plate II, fig. 21.)

Commencing with the palest form in the group we get an aberration with pale straw-coloured superiors, a red-brown streak from centre of base to termen, and slight indications of additional longitudinal striations of the same red brown. I name this form ab. *flavana* n. ab. I have only found it in one Kentish locality, and from here a few years ago I obtained ten examples, including the type, out of a total of about 300 imagoes bred.

(59) ab. *radiana* Hüb.

Synonymy.—Hübner, Tort. fig. 177 (1797); Haworth, Lep. Brit. p. 412, No. 58 (1811); Hüb. Verz. p. 384, No. 3726 (1826); Stephens, Cat. ii, p. 185, No. 7061 (1829); Curtis, Guide, 1st edn., p. 174, (1829); Rennie, Conspect. p. 176 (1832); Stephens, Haust. iv, p. 154 (1834); Curtis, Brit. Ent. 2nd edn., 16, No. 28 (post 1834); Id., Guide, 2nd edn., p. 202 (1837); Wood, Index Ent. No. 1065 (1839); Westwood, Brit. Moths, vol. ii, pl. xciii, fig. 9, and p. 156

(1845); Heinemann, Schmett. Deutsch, i, p. 15 (1865); Staudinger, Cat. Lep. Eur. part ii, No. 652 H (1871); Snellen, Vlind. Ned. Micr. p. 177 (1882); Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1446g (1901); Spuler, Schmett. Eur. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Hübner figured and named *ab. radiana*, but, not describing it, I have made the following description from his figure: Ground-colour of the superiors pale straw colour. From the centre of the base to the termen extends a dark brown line, narrow at the base, but widening out to a fan shape at the hind margin, where it extends across almost the whole of the wing. On the inner margin is a narrow dark brown striation, extending the whole length: there are faint traces of the same dark brown colour on the pale costal vitta. The head and thorax are dark brown; hind wings unicolorous pale grey.

Ab. radiana is not uncommon in the south of England: I have a number of specimens from Kent and Wimbledon, and also single ones from Wicken and the Isle of Wight, but have not seen any from localities further north.

(60) *ab. brunneoradiana* n. ab.

To a red-brown form with the longitudinal striations covering the whole of the superiors, except the costal vitta, I give the above name.

It is locally not uncommon in the south of England: I have a considerable number of specimens, including the type, from Wimbledon and from Kent, but have not seen it from elsewhere.

(61) *ab. subradiana* n. ab. (Plate 2, fig. 22.)

Similar to the last with the exception that the striations are of a very dark brown tint.

I have not found this aberration common, and only possess four examples, including the type, from Wicken, and two from Lancashire.

(62) *ab. flavicostana* n. ab.

I give this name to an aberration similar to *ab. brunneoradiana*, except that the costal streak is only faintly tinged with red brown, and therefore much paler than in that form. So far as I am able to understand, Stephens (Catalogue, ii, p. 185, No. 706, 1829) gave this aberration the name of *strigana*, but afterwards (Haustellata, iv, p. 154, 1834) cancelled it as equal to *ab. radiana* Hüb. Unfortunately his description is so vague, and in the absence of a type one cannot be certain what is intended, but on this assumption I give the following synonymy:

Synonymy.—Curtis, Brit. Ent. 1st edn., 16, No. 38 (1824); Stephens, Cat. ii, p. 185, No. 7060 (1829); Id., Haust. iv, p. 154 (1834); Curtis, Guide, 1st edn., p. 174 (1829); Rennie, Conspect. p. 176 (1832); Curtis, Guide, 2nd edn., p. 202 (1837); Kennel, Pal. Tort. pl. iv, fig. 2, and p. 72 (1908) (*radiana*).

The only figure showing this aberration so far as I know is Kennel's; it is an excellent one, and anyone in doubt of the characteristics of the form should consult it. I have examples from Wimbledon, including the type, the Isle of Wight, Wicken and Lancashire.

(63) ab. **trivittana** n. ab. (Plate 2, fig. 23.)

This rare and beautiful aberration has the costal vitta hoary white; from the centre of the base of the superiors to the termen are two lines, or vittae, the front one dark brown, the one nearest the inner margin ochreous brown. The costal edge of the superiors is lightly shaded with red brown. The inner margin of the wings behind the third vitta is covered with the dark longitudinal striations usual in the aberrations of this group.

I have one example of ab. *trivittana* bred from a Wicken larva; two others from the Bond Collection, labelled Wimbledon, and a fourth (the type) from the Webb Collection, without data.

Divisana Group.

These, perhaps the most beautiful of all the *hastiana* forms, are distinguished by a pale costal area or vitta, a dark central vitta, shading off gradually to the red brown, or grey, inner marginal area.

(64) ab. **divisana** Hüb.

Synonymy.—Hüb. Tort. 198 (1818); Id., Verz. p. 384, No. 3728 (1826); Stephens, Cat. ii, p. 185, No. 7059 (1829); Curtis, Guide, 1st edn., p. 174 (1829); Rennie, Conspectus, p. 176 (1832); Stephens, Haust. iv, p. 153, and pl. 34, fig. 1 (1834); Curtis, Brit. Ent. 2nd edn., 16, No. 29 (post 1834); Id., Guide, 2nd edn., p. 202 (1837); Wood, Index Ent. No. 1064 (1839); Westwood, Brit. Moths, vol. ii, pl. xcvi, fig. 7, and p. 156 (1845); Heinemann, Schmett. Deutsch, i, p. 15 (1865); Staudinger, Cat. Lep. Eur. ii, No. 6521 (1871); Fettig, Cat. Lep. Alsace, p. 34 (1882) (*basilinea*); Staudinger, Cat. Pal. Lep. ii, p. 80, No. 1446κ (1901); Spuler Schmett. Eur. vol. ii, p. 241 (1910); Meyrick, Gen. Ins., fasc. 149, p. 64 (1913).

Ab. *divisana* was figured and named by Hübner, but not described; I have therefore made the following description from his figure: Superiors with a dark central vitta from base to termen shading off on the inner margin to claret colour; the area between

this vitta and the costa is hoary white with a slight grey shading on the edge of the costa; the area between central vitta and inner margin is light fuscous; the head, thorax and inferiors are fuscous of a rather deeper shade than the inner marginal area of the superiors (Hübner, *l.c.*).

British specimens of this form have much more claret colour suffusion than is shown in Hübner's figure, and the costal area also is not infrequently tinged with claret colour. It is widely distributed but apparently always rare, as the result of my own breeding shows. Out of between 2000 and 3000 *hastiana* bred only seven have been ab. *divisana*—three from Lochinver, three from Wicken, and one from Lancashire. Probably, however, it is more abundant in localities I have not worked, as I have about a score of examples from the Bond Collection, labelled Wimbledon. I have also one from Eltham.

(65) ab. **nigrodivisana** n. ab.

Similar to Hübner's figure of ab. *divisana*, with the exception that it is entirely grey, black, and white, without any tinge of the claret colour that obtains in the last aberration.

I understand ab. *nigrodivisana* occurs regularly in Lancashire, from which county my type came. I take it this is a melanic development of the previous aberration.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

BY G. T. LYLE, F.E.S.

(Continued from p. 229.)

Corvulus, Marsh.*

A species with a length of 3-4 mm., the metathorax coarsely sculptured and radius of hind wing sinuated (in two specimens I have examined this nervure is sub-obsolete). The antennae of the female are very distinctive being stout, thickened beyond the middle and abruptly attenuated near the apex, 24-26-jointed.

One male and two females are in the Fitch Collection, no doubt all captured by Marshall, for the male and one female are marked "L" (Leicester), and the other female "B" (Barnstaple, Devon). I have four males which I must refer to this species, two with 27 and two with 29-jointed antennae (type has 27); two were taken in a narrow, high-walled lane at Cambridge on August 1st, 1918, and June 12th, 1919, respectively, one on the Gog.

* Trans. Entom. Soc., 1885, p. 127.

Magog Hills on July 1st, 1917, and the fourth in New Forest, July 2nd, 1921.

Contractus, Nees.*

Although considered by Reinhard to be a synonym of *sulcatus*, Nees, this is quite a good species, and has since been restored to its proper position (Gen. Ins., xxii, p. 94). Marshall followed Reinhard—no doubt through lack of material.

Both sexes entirely black with the exception of anterior femora at extreme apex and anterior tibiae at base and beneath; fore tarsi piceous. Metathorax rugose, bidentate, with two subparallel longitudinal carinae. Mesothorax and scutellum somewhat coarsely punctate, the latter centrally smooth. Abdomen striato-rugose. Wings fusco-hyaline; radius of hind wing not bisinuate. Antennae much shorter than body in both sexes, not centrally thickened; male 19-jointed, female 16-jointed. Length $3\frac{1}{2}$ –4 mm., expands 6–7 mm.

The following is the original description of the female:

"Ch. niger, tibiis anterioribus rufo-piceis, abdomine obovato, subtilissime punctulato-rugoso; terebra recondita; antennis articulis septemdecim (counting the radicle as was Nees' practice). Long lin. $1\frac{1}{2}$. Antennae ratione reliqui corporis validi, articulis extremis discretis, ovalis. Color corporis niger, opacus, anus rotundatus. Pedes nigri, femoribus anterioribus apice, tibusque üsdem tolis rufo-piceis; postici fere toti nigri, tibiis tamen basin versus parum rufescentibus. Tarsi subfusci alae obscure hyalinae."

Nees did not know the male, which has a very distinct apical semicircular fissure beneath the abdomen and 19-jointed antennae, otherwise it agrees with the description of the female.

I captured a male at the Fleam Dyke, Cambridge, June 30th, 1918, and a female on the Gog Magog Hills, June 22nd, 1919. There is a single male without data in the Dale Collection under the name of *C. catulus*.

Risorius, Reinh.†

Harwood has a male labelled "Higham 27/7/85" (probably from Capron's Collection), which I think must be of this species; it agrees with the descriptions of Reinhard and Marshall, excepting that the antennae are 21-jointed, not 18 as given by Reinhard and 20 according to Marshall.

Very like *sulcatus*, but the legs and nervures are darker and the scutellum more coarsely sculptured. Metathorax acutely bidentate at hind angles and with two central longitudinal carinae, each of which is produced into an obtuse denticle. Harwood's specimen has a length of 3 mm. only; Marshall gives the length as 3–5 mm.—rather a wide margin.

* Mon., i, p. 298.

† Berl. Ent. Zeit., 1867, p. 360.

Secutor, Marsh.*

Described by Marshall from a single male taken by himself in an osier bed at Nunton near Salisbury, September 3rd, 1884, and now in the British Museum. Distinguished from *sulcatus* and other closely allied species by the unusually produced pronotum.

Latrunculus, Marsh.†

Very similar to *sulcatus*, but, at any rate in the only two examples I have examined, easily distinguished therefrom by having the first joint of the flagellum testaceous. Marshall considered that this might be the *C. parvicornis* of Thomson, but later writers have not confirmed. The type is in the British Museum, and there is one of the co-types in the Fitch Collection, viz. the solitary male which still bears Marshall's label; in the latter insect the anterior femora are dull rufo-testaceous and not black as mentioned by the describer. Male antennae 22-jointed, female 16-jointed.

I have found a single female, without data, in the Dale Collection.

(To be continued.)

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

By F. C. BOWDITCH.

(Continued from p. 235.)

Galerucella spinipennis sp. nov.

Rather large, parallel; mouse grey: labrum, antennae, two larger thoracic spots (one on either side) and tibiae and tarsi more or less blackish: apex of elytra sinuate: sutural angle mucronate.

Type: 2 examples, Salinas Beni R., vii. 95 (Stuart), Capella, Brazil. Length $6\frac{1}{2}$ –7 mm. (Coll. Bow.).

Head from antennae back, all one piece, thickly finely punctate except the extreme neck, which is smooth and shining, longitudinally, faintly grooved: antennae reaching nearly the middle of the elytra, basal joint rufous, 3 joint the longest: thorax not markedly transverse, depressed on either side and dark coloured, faintly longitudinally furrowed; scutell nearly quadrate: elytra very thickly finely punctulate, rugose, with well-defined mucronate sutural angles: the entire upper surface of the body is finely pubescent: claws bifid. What seems to be the ♀ (Salinas spec.) has a long deep groove on the last ventral segment; the Capella spec. ♂? has the last ventral deeply and strongly emarginate or incised.

* Trans. Entom. Soc., 1885, p. 135.

† Ibid., p. 138.

SOUTH AMERICAN LUPERODES.

Less than half a dozen species of *Luperodes* have been described from South America. Mr. Jacoby had two, *brasiliensis* and *inornata* (both types in my collection). Harold describes *Kirschi* (Jacoby's specimen now in my collection probably *Luperus*), and Kirsch two, neither of which I can identify with any of my material. A good many new forms call for recognition. All have the requisites of the genus, *i. e.* open coxal cavities and elongate hind tarsal joint, so these points are not specifically mentioned in the various descriptions which follow. The length of the antennal joints varies at least in some species, according to sex, *vide* Jacoby's description of *L. nigricornis*, *Biologia*, pp. 592-3.

***Luperodes masoni* sp. nov.**

Medium sized, elongate, parallel; obscure testaceous (like *inornatus* Jac.); antennae except the base, and the tibiae, tarsi and apex of femora black.

Type: 1 specimen, Cincinnati, Trail, 17 . vii . 20, Sierra de S' Lorenzo 4-6000 ft.; Magdalena, Columbia, F. R. Mason # 133. I associated with this 5 examples from Caracas, Venezuela, which vary slightly. Length 4.5-5 mm. (Coll. Bow.).

Head darker than the body; antennae reaching the middle of the elytra; 2 basal joints more or less rufous, 3 half longer than 2; thorax broad, sides nearly straight, surface very finely punctulate, obsoletely transversely impressed; elytra thickly, finely and evenly punctured.

The upper surface shows none of the piceous markings of *inornata* Jac., and the colour of the legs and antennae differ.

***Luperodes rufescens* sp. nov.**

Medium sized, a little stouter and not as parallel-sided as *Masoni*; reddish, testaceous, shining; eyes black; antennae black, with last two joints whitish (except the extreme tip black); tibiae and tarsi black with claw joint rufous.

Types: 10 specimens in 2nd Jacoby Collection, Peru (green label), Pachitea or Callanga. Length 4.5-5 mm. (Coll. Bow.).

Antennae longer and more slender than in *Masoni* or *inornatus*, reaching nearly the tip of the elytra; joint 3 scarcely half longer than 2, remainder elongate and slender; thorax transverse, shining, feebly punctulate and with very obsolete depression, sides rounded; elytra thickly and evenly punctate; easily separated by the colour of the antenna, and claws.

***Luperodes blumenensis* sp. nov.**

Medium sized, testaceous; eyes black; antennae dark blackish-brown with the bases of the joints lighter; the apex of the tibia and the tarsi brown.

Type: 1 (♂ ?) Blumenau, So. Brazil (Reitter) # 1. Length $4\frac{1}{2}$ mm. (Coll. Bow.).

Antennae slender, $\frac{2}{3}$ length of body; 3 joint half longer than 2, the basal joints more or less rufous; thorax transverse, very minutely punctulate, with fairly well-marked transverse depression; elytra very thickly and evenly punctate. Easily separated from *inornatus* and the foregoing species by the better marked thoracic depression and the coloration of the legs.

***Luperodes elongatus* sp. nov.**

Medium sized, narrow and parallel; testaceous yellow; head with antennae (except the basal and last two joints); scutellum and triangular spot adjoining, humeral spot and lateral edge of elytra nearly to apex, the epipleurae, metasternum, metapleurae, tibiae, tarsi and last ventral segment, black.

Type: 1 (♂ ?), Chaco, Bolivia. Length 4 mm. (Coll. Bow.).

Head with sulcate front; antennae nearly as long as body, basal joints more or less rufescent, 2, 3 nearly equal, 10, 11 testaceous, extreme tip black; thorax finely punctate with nearly straight sides, transverse depression obvious, especially at the side; elytra with surface somewhat dulled by the very close thick punctation; the black lateral stripe does not show looking from above and stops before the apex at the curve of the elytra.

***Luperodes rosenbergi* sp. nov.**

Small; dilute brownish black, with testaceous legs; antennae testaceous, gradually darkened towards the tip; thorax with dark edges and three indistinct piceous spots placed transversely about the middle; elytra with all the edges darkened and the disk diluted, so as to appear much lighter.

Types: 4 examples, "Above Chimbo 3000', viii. '97 (Rosenberg)." Length 3 mm. (Coll. Bow.).

Front of head with a transverse groove and a few fine punctures, vertex smooth; antennae nearly as long as body; joints 2, 3 nearly equal; thorax very finely punctulate and obsoletely transversely depressed; elytra thickly and evenly punctulate; first joint of hind tarsi very elongate. An obscure little form somewhat resembling *L. salvini* Jac., from Guatemala, but smaller.

***Luperodes semimarginatus* sp. nov.**

Small, testaceous, sides of thorax blackish; suture of elytra very narrowly piceous; base of elytra round the shoulder and down the edge for one-third of the length narrowly blackish.

Type: Blumenau, So. Brazil (Reitter), # 178. Length 3 mm. (Coll. Bow.).

Antennae more or less fuscous towards the tip ; head transversely sulcate and punctate ; thorax with slightly rounded sides, transverse depression well marked at the sides, but obsolete at the middle, surface closely punctured ; elytra very thickly and more coarsely punctate than the thorax ; first joint of hind tarsus very long ; the lateral blackish markings chiefly distinguish this form.

***Luperodes obscurus* sp. nov.**

Medium sized, elongate, parallel, testaceous ; neck, antennae (except the base), extreme edges of the thorax and elytra (including the suture) and the tibiae and tarsi, black ; also 5 piceous spots placed transversely on the thorax.

Type: 1 example, Cauca Valley (Payne). Length $4\frac{1}{2}$ mm. (Coll. Bow.).

Head with cross and vertical sulcations on the front, very minutely punctulate ; thorax with only slightly rounded sides and three foveate depressions (in place of the usual transverse depression), the side foveae corresponding with piceous spots, the other in front of the scutel ; surface thickly and finely punctate ; elytra thickly and coarsely punctate, rather rugose ; has the thoracic spots of *inornatus* Jac., and the form and elytral punctuation of *elongatus* supra.

***Luperodes pallidipennis* sp. nov.**

Medium sized, elongate, parallel, shining black ; elytra pale testaceous ; bases of the femora rufous.

Type: 1 example, Chaco, Bolivia. Length 5 mm. (Coll. Bow.).

Head with a well-marked transverse depression above the eyes and a few fine punctures ; antennae about half as long as elytra ; 3 joint slightly longer than 2 ; thorax transverse, with nearly straight sides and a well-marked transverse depression, the latter in certain lights showing rufous spots through the black surface, rather thickly and finely punctured ; elytra very thickly finely punctate, corrugate, somewhat obsolete towards the tip ; first joint of hind tarsi very elongate ; the colour scheme easily separates this form.

***Luperodes fumescens* sp. nov.**

Small, dusky brown, testaceous ; thorax rather lighter with narrow black edging on the sides ; elytra uniform brownish with the edges narrowly black, the suture very finely so ; legs testaceous with the tibiae and tarsi dark brown.

Type: 1 example, Cartagena, 11 . vii . 20, Chaparral, Bolivar, Columbia (F. S. Mann), # 105. Length $3\frac{1}{2}$ mm. (Coll. Bow.).

Head with well-marked sulcus between the eyes, front and vertex finely punctured ; antennae a little more than half the

length of the body, very dark brown with the 3 basal joints rufous; 2, 3 nearly equal; thorax with very finely punctulate convex surface, with only a very faint indication of any depression, the sides slightly rounded and narrowly edged with black; elytra more strongly punctured than the thorax. The species is close to *inornatus* Jac., but it seems to me distinct; the 1 joint of the hind tarsi is very elongate.

***Luperodes pallipes* sp. nov.**

Small, light testaceous, with the main body above and below uniform chocolate brown; antennae nearly as long as body; testaceous, with the tips gradually darkened until the last two or three are uniform brown.

Type: 1 example (♂?), San Augustin, Mapiri, 3500 ft., ix. 96 (Stuart). Length $2\frac{1}{2}$ mm. (Coll. Bow.).

Head with transverse sulcus only faintly indicated with a few fine punctures; antennae with 2 joint a shade longer than 3 and noticeably stouter; thorax with lightly rounded sides, obsolete depression and finely punctulate surface; elytra uniformly punctate, more strongly than the thorax. A delicate little form and easily differentiated by its coloration.

(To be continued.)

NOTES AND OBSERVATIONS.

ANOSIA PLEXIPPUS IN SUSSEX.—On August 28th last a specimen of *Anosia plexippus* was captured in the village of Selmeaton near Berwick, Sussex, and recorded by Mr. John C. Tunnard in *The Field*, September 20th. Mr Tunnard has kindly informed me that this fine butterfly was "feeding on Buddleia (*Variabilis magnifica*) bloom, from which it flew on to a bush of *Rosa rugosa*, upon which it was caught. It appeared to be sleepy and lethargic." I have since examined the specimen, which is a male. Except for a small piece missing from the margin of the right hind wing it is in good condition and richly coloured. The capture of this example now brings up the number of British-caught specimens to over thirty since the first appearance of this butterfly in Britain in 1876.—F. W. FROHAWK.

COLIAS CROCEUS AT EASTBOURNE.—On the banks along the Parade here *Colias croceus* has been seen several times lately. First on September 24th a small male was noted, on 26th two. It was then lost sight of until October 8th, when a very fresh one which appeared to be a female turned up, and this morning two others, one very fresh, the other apparently somewhat faded, were seen.—ROBERT ADKIN; Eastbourne, October 17th, 1923.

In Devon.—On Sunday last, September 30th (a warm, sunny day), whilst stopping for lunch on the main road from Holsworthy to

Bideford, North Devon. I took a worn male specimen of *Colias croceus*, which I again liberated. Although the insect was almost common last year in South Devon, this is the only specimen I have seen this year.—S. T. STIDSTON, Engr.-Comdr. R.N.: H.M.S. "Woolwich," at Devonport, October 1st, 1923.

In Hants and Dorset.—I netted a pair of *C. croceus* in cop. at New Milton on Sunday, September 30th. Mr. A. Ford, of Bournemouth, informs me that he saw a male at Dorchester on September 26th.—H. JENNINGS; "Marlowes," Barton Court Avenue, New Milton, Hants.

[These, the records on p. 235 (October) and on p. 260, are the only records that have come to hand this year. There seems to have been no spring invasion, and only a small but wide-spread immigration in the autumn.—ED.]

COLIAS CROCEUS IN BRITTANY.—In view of the shortage in England this season of *Colias croceus (edusa)*, as reported in the October number of the Entomologist, it may be of interest to record the fact that it has also been very scarce in this part of Brittany; I have only seen four specimens this summer.

In this connection it is interesting to note that according to M. Charles Oberthür, this species, although a regular inhabitant of central and Southern France, is not a native of the peninsula of Brittany, but is an annual immigrant, as in England, and that the years of plenty in Brittany correspond with those in England.—B. H. COOKE (Col.); Villa d'Albret, Dinard, France, October 9th, 1923.

THECLA W-ALBUM IN STAFFORDSHIRE.—Although previously recorded from Needwood Forest near Burton-on-Trent, I think it worth recording, as evidence of its existence still, that I saw there five specimens of *Thecla w-album* on July 25th last, and two on July 26th. Much of the woodland has been, and is still being felled, and it is feared that the species is decreasing in numbers, and may eventually disappear altogether from the locality before long.—H. HENSON; 138, Oak St., Burton-on-Trent.

POLYGONIA C-ALBUM IN STAFFS.—Yesterday, September 30th, a specimen of the Comma butterfly, *Polygonia c-album*, was taken in the garden here in very good condition. It seems that this butterfly is on the increase, as it has never appeared to my knowledge before in this immediate neighbourhood, which is 500 ft. above sea-level, very bleak, and a very poor locality for butterflies in general. *Pyrameis atalanta* is also unusually abundant this year.—A. SOPWITH; Chase-town, nr. Walsall, Staffordshire.

ABERRATIONS OF MELITAEA CINXIA.—From a number of wild collected larvae, I have this year obtained three beautiful aberrations of this insect, one of which has the fore-wings upperside black and the hind-wings much suffused, with the ordinary markings. Also two specimens with the undersides with the basal areas fulvous and the central areas practically clear of black dots.—G. NOBBS; North Lodge, East Cowes, Isle of Wight, October 17th, 1923.

ABERRATION OF *HIPPARCHIA SEMELE*.—I wish to record the capture of a female which shows absolutely no trace of the normal two spots on each fore wing, nor of the spot on the hind wing. It is otherwise normal and in good condition, though rather undersized. It was taken at Aberdovey, Wales, on August 16th, 1922, by my nephew, Master Alfred Cewen.—W. BOWATER: 23, Highfield Road, Edgbaston, Birmingham.

MACROGLOSSA STELLATARUM AT SEAFORD, SUSSEX.—On September 28th last, when walking over the cliffs to Cuckmere Haven, I noticed one or two insects flying inland from the sea. These looked like very large "humble bees," but their progress was so rapid that one could not determine just exactly to which Order they belonged. On returning to my diggings Miss Gurr showed me a specimen of *Macroglossa stellatarum* that had been taken in a stationer's shop in Seaford that afternoon. I think it extremely probable that the insects seen on the cliffs were also referable to this species.—RICHARD SOUTH.

LAPHYGA EXIGUA AT LIGHT.—On September 10th, after an evening spent at the sugars on the South Devon coast, I noticed a Noctuid, at rest on the wall near a lighted oil lamp, which on examination proved to be *L. exigua*. The window of the room was open and it had evidently been attracted by the light. I captured a few specimens of the same species at sugar, the first, a worn one, on September 3rd, and the last, quite fresh, on September 14th. *Colias croceus*, which was so plentiful here last year, was entirely absent, except for one specimen, a male, which I saw on September 11th.—G. W. WYNS: Hampton-in-Arden, Warwickshire, October 16th, 1923.

MACROTHYLACIA RUBI LARVAE IN PROFUSION IN NORTH WALES.—Whilst golfing over the Borth course in late September, Mr. Hubert Adams, of The Drive, Port Hill, noticed larvae in enormous numbers feeding on wild bramble, and thinking they would interest an entomological friend brought a few for identification. They were exceedingly fine specimens of *M. rubi*, and he has since collected about a hundred. They are still feeding vigorously on bramble and raspberry.—B. PRITCHARD: Headingley, Port Hill, Shrewsbury, October 14th, 1923.

AUTUMN RHOPALOCERA IN SOMERSET.—On the two hot days we were favoured with on September 29th and 30th, I saw a large number of *Pyrameis atalanta*, a few *Vanessa io* and *V. urticae*, and one *Polygonia c-album* on my herbaceous borders, and took two *Pararge aegeria* and saw two more. This last species I have not seen here for a long time.—WALDEGRAVE: Chewton Priory, Chewton-Mendip, Somerset, October 7th, 1923.

NOTES FROM THE BUCKS CHILTERN.—*Nisoniades tages* has been on the wing this year for an exceptionally long period—from the 12th of May, when I first saw it, until the second week in July, when I observed it for the last time on July 11th. It was flying in many places on July 7th when I netted a specimen in excellent condition. I find there is a second brood of *Cupido minimus* in two localities

in the Chilterns this year, where I saw freshly emerged specimens on the 14th and 22nd of August.—R. G. SIMPSON: Verona, Manor Park Crescent, Edgware, Middlesex.

POLIA CHI: A CORRECTION.—Referring to the note in the "Entomologist" for October, 1923, stating that the recent captures of *Polia chi* are a new record for Gloucestershire, Mr. C. Granville Clutterbuck, F.E.S., of Gloucester, has kindly sent me an extract from the late Mr. V. R. Perkins' list of Lepidoptera for the county, which he holds in MS. This list was prepared for the Victoria County History, but has, unfortunately, never been published. The records are as follows: "Moreton-in-Marsh (rare), Weaver; Great Witcombe, Newstead; Charlton Kings (scarce at rest), Robertson; Gorsley (rare), Rev. E. M. Smith; Mitcheldean (frequent), Searancki; Alderley, Rev. C. Perkins, 1904." Mr. Clutterbuck informs me that he has also taken the species at Stroud, Wittrington and Haresfield, also that Capt. Simpson-Hayward reports it as common on his garden walls at Icombe.

The list of Lepidoptera of the Bristol District was compiled by the late Mr. Alfred Hudd for the Bristol Naturalists' Society in 1874 and subsequent years, and, as in all lists published by the Society, the Bristol Coalfield as defined in the Geological Map of Mr. William Sanders, F.R.S., was used as the boundary of the district. This takes in the southern portion of Gloucestershire from Berkeley, and the northern part of Somerset to Wells, so the limit excludes a great portion of each county. Mr. Hudd kept an interleaved copy of his list, which is now in my possession, and entered up any subsequent records. *P. chi* did not occur at all in his printed list, but MS. mention of it appears in his notes for Clevedon, Somerset. Judging from this and Barrett's remarks on the species I was led to the conclusion that there was no record for Gloucestershire. It will be noticed that all those given above are from the northern part of the county, except the record from Alderley, which is close to Wotton-under-Edge, where also I have now heard it has recently been taken by Mr. T. Hewer. It is evident that the species is spreading southward, and that we must consider it a permanent inhabitant of Gloucestershire.—GEO. C. GRIFFITHS.

I am indebted to several correspondents for still further information as to the occurrence of *P. chi* in Gloucestershire. Dr. R. C. L. PERKINS writes that in *The Fauna and Flora of Gloucestershire*, by C. A. Mitchell and W. B. Strugnell, 1902, p. 256, the Moreton-in-Marsh (Weaver) record referred to above by Mr. Griffiths is to be found in print, and that in the same MS. list of the late V. R. Perkins it is also recorded from Wotton-under-Edge, 1904, of which place Dr. Perkins goes on to say: "Each summer in which I have visited Wotton, from 1907 up to and including this year, I have found *P. chi* numerous and generally distributed there, both on tree-trunks, stone walls and the sides of houses, and very easy to collect. On one occasion I happened to meet Mr. T. F. Hewer, of Bristol. . . . he visited the spot before returning home and had no difficulty in finding specimens of the moth on the trees. In Devonshire I have found it commonly, not only on the moor but near the coast at Brixham, and also just outside the village of S. Brent on the banks

of the Avon. In neither county amongst scores of specimens examined have I seen any notable variety." Mr. J. F. BIRD also writes that he "used to find this moth, and the larvae, in the county at Brockweir fourteen years ago (*Entom. Rec.*, vol. xxii, p. 41). And Mr. J. R. HUDSON tells me that it was taken at light by Mr. Baxter at Lechlade on 9th Sept., 1920.

It would seem, therefore, as Mr. GRIFFITHS remarks, that the species is well established in the county. It is strange, therefore, that the records from Moreton-in-the-Marsh (*Fauna and Flora of Glos.*), and Brockweir (J. F. Bird) should be the only records to get into print. —ED.]

NOTE ON AN EMERGENCE OF *CORDULIA AENEAE* L.—On June 30th last, in Epping Forest, I found an empty nymph-skin of *Cordulia aenea* L., grasping a twig which grew out from the crown of an oak tree some distance from the nearest pond. Measurements were taken of the shortest distance from pond to tree, and these were as follows: From water's edge to foot of tree $21\frac{1}{2}$ feet, there being in the first 3 feet a sloping bank $2\frac{1}{2}$ feet high. From the foot of the tree vertically to the twig on which the nymph-skin was found the distance was $6\frac{1}{2}$ feet. The larva must have traversed as a minimum the distance given, assuming that a straight course was taken. It is highly probable, however, that a much greater distance was actually covered. Emergence had evidently been quite successful. It is difficult to understand why the nymph should have crawled so far when rushes and other suitable supports for emergence were abundant at the water's edge. —C. L. WITHEYCOMBE: Walthamstow, July 10th, 1923.

RECORDS OF TWO BRITISH ORTHOPTERA. For reasons of locality it may be useful to place on record two species of long-horned grasshoppers which have been received recently at the British Museum. In one case a male of *Mecanema thalassinum*, De Geer, was sent by Mrs. O. L. Ruck from Machynlleth, Merionethshire, on 21st September, 1923, and this appears to be the first record of the insect for Wales. The second species, *Decticus verrucivorus*, Linn., was found in some numbers near Corfe Castle by Mr. F. R. Hinkins and Mr. R. C. Hinkins, who were good enough to present an example of each sex. The male specimen was taken on 16th September, 1923, and the female on the 30th of the same month, and both were of the green form, the brown form not having been met with. I have not seen any previous notice of this species from any locality in Dorsetshire. —HERBERT CAMPION: British Museum (Nat. Hist.), Cromwell Road, S.W. 7, October 8th, 1923.

CAPTURES OF TWO INTERESTING BRITISH DRAGONFLIES.—My friend, Mr. Cyril O. Hammond, has been good enough to show me two of the dragonflies taken by him this year, and to give me an account of the circumstances in which they were obtained. One of the insects was a female of *Orthetrum cancellatum*, Linn., which was found on 23rd June, after a flight, resting upon the stems of bracken, near the Pen Ponds, in Richmond Park, Surrey. The other specimen was a male of *Lestes dryas*, Kirby, from a road-side ditch near Kings Lynn, Norfolk (10th July). Nothing more was seen of the species either on this occasion or during subsequent visits to the same

locality. The ditch was well furnished with vegetation and yielded a few examples of *Lestes sponsa*, Hansem. So far as I am aware, this capture of *L. dryas* is the first of its kind to be made in Norfolk.—HERBERT CAMPION; British Museum (Nat. Hist.), S.W. 7, October 12th, 1923.

HOUSE CRICKETS IN A STACK OF STRAW AT EALING.—From recent observations of my own, it would appear that the outdoor life of the house cricket in this country is not confined to the dumps of household refuse, of which several cases have been recorded.* Throughout the past summer, and possibly for a still longer period, a large stack of straw and other stable refuse has been standing in some market-gardens within sight of my home, but well removed from that and all other houses. It has been customary for me to pass and repass this stack almost every evening, and I noticed that, when the natural shortening of the days and the consequent restoration of Greenwich time caused my daily visit to the site to coincide with the hour of nightfall, I heard the unmistakable chirping of several house crickets proceeding from the stack. The insects were evidently not present in any great numbers, and I never succeeded in securing a specimen. Furthermore, I never detected any sound of stridulation when I made occasional visits to the stack either in full daylight or in the hours of total darkness.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, W. 5, October 11th, 1923.

REVERSION TO ANCESTRAL COLOURING.—Although, as Mr. Huggins suggests, the process of selection is still going on, he fails to see that variation in temperature may easily produce a throwback; indeed, experiment by various workers has definitely proved that drought, moisture, heat and cold have a powerful influence upon colouring. If *Limenitis sibylla* became blacker and blacker each succeeding year one might fairly assume that protective assimilation was the cause, only there would be no sense in such a view unless we could show that its melanic colouring was protective: as, however, the black form may be fairly common in some years and then may almost entirely disappear for many years afterwards, we know that it cannot be protective and there is no reason for assuming that it is not reversional. When Mr. Huggins talks about fading colours in relation to *Neorinopsis sepulta* he evidently imagines that it exhibits the faded appearance of a bleached *Arctia caja*, but he is quite mistaken; on the contrary the colouring has been wonderfully preserved in the fossil. I don't think it evidences much power of observation for any entomologist to accept the view that the Lepidoptera have weak sight. To see a large moth shooting like a bullet directly at a stone wall and turning or rising just in time to avoid crashing into it; to watch a butterfly suddenly turning to pursue one of its own colour which it has caught sight of at a distance of 90 to 100 feet does not indicate clouded vision; if one may judge by the lightning-like speed with which Lepidoptera often evade the swoop of a net, it would seem that their sight must be far keener than ours. At the end of the first paragraph of my observations last month the printer has made me say "thin black markings" it should read "their black markings." ARTHUR G. BUTLER.

* *Entom.*, liv, pp. 127, 246; lv, p. 23. *Ent. Mo. Mag.*, lvii, p. 185.

RECENT LITERATURE.

Animal Life in Deserts: A Study of the Fauna in Relation to the Environment. P. A. BUXTON. Pp. xv + 176. 43 plates and text-figures. London: Edward Arnold & Co.

OF the seven chapters into which this work is divided, two deal with climate and soil, one treats of the flora, and two of the physical environment of animals; the sixth deals with the relations of plants and animals, the seventh with the colours of desert animals. A number of scattered observations have been added to the author's own experiences in Mesopotamia and Palestine, and the whole welded into a very readable and most instructive volume. The entomological matter is necessarily distributed throughout the work, but many interesting questions are raised. Attention is called to the numerous cases of black insects which not only live but apparently thrive on the surface of the desert in the glare of the sun, where they are most conspicuous objects and fully exposed to intense heat. Dr. Buxton does not seem to think that the colours in this case are warning colours, as on one occasion a wheatear was found to be stuffed with *Adelesmia*, one of the blackest and most conspicuous of the desert-inhabiting Tenebrionid beetles. But one may easily be misled by such an isolated observation. Whilst apparently keeping an open mind, he seems to suggest that this blackness may be due to inheritance, and not altered because not disadvantageous to the species: which sounds to us the equivalent of saying that the species does not require protection either from its natural enemies or from the sun's rays, although many of its near relations apparently do need it and have acquired it. The author also appears to scoff at the protective coloration theory, because, he says, it affords no protection when the animal is moving. This seems a curious objection. Surely whatever colour an animal may be its movement will betray it. Speaking of certain silvery-coloured hoverflies, he says their colour would be protective were their habits not faulty. Such an insect, one would imagine, *only* needs protection when at rest, and then its colour affords it. He concludes with the suggestion that we shall never solve the riddle of the colours of desert animals until we rid ourselves of our belief in protective coloration, and appears to incline to the view that a study of physical conditions will supply the key. By all means study the physical conditions too, and particularly their effects on individual species. It will no doubt be found they are responsible for a very great deal, but why throw over the protective coloration theory just because it does not cover the *whole* of the facts? But none the less we owe Dr. Buxton a great deal for calling attention to this subject, and believe his book may inspire others to search for that wider knowledge which alone will explain the facts.

OTHER PUBLICATIONS.

The Annals of Tropical Medicine and Parasitology, vol. xvii, No. 3, Oct., 1923, contains only two items of direct entomological interest: A Pyrrhocorid Bug capable of Biting Man, by B. BLACKLOCK, and a Note on *Aëdinus amazonensis*, Metz, by A. M. EVANS.

Catalogue of Indian Insects. Part 2: Culicidae, by R. SENIOR WHITE, 1923. This publication of the Government of India consists of 124 pp., and appears to be a very complete synonymic catalogue covering the bionomics, distribution, etc.—but not the medical interest—of the Culicidae of the region covered by the Fauna of India publications, complete to 1921.

Memoirs of Queensland Museum, vii, part 4, Dec., 1922. Two systematic papers, by COCKERELL, and by COCKERELL and HACKER, on Hymenoptera, and a paper by HACKER, On the Emergence of two Tube-dwelling Homopterous Insects (with illustrations), make up the sum of the entomological matter contained in this the final part of vol. vii.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—August 9th, 1923.—The President in the Chair.—Mr. Step exhibited a living *Prionus coriarius* (Col.) from Ockham; Mr. H. J. Turner, the life-history of *Coleophora troglodytella*, of which the larvae were found by Dr. Robertson at Lyme Regis, a short series of *Emmelesia affinitata* from the same locality, and a long bred series of *Eupithecia dentata* (*campanulata*) from larvae found at Rammore; Mr. Blenkarn, the extremely local *Dryops anglicanus* (Col.) taken at Wicken in May, *D. auriculatus* from Mickleham, and *Balaninus betulae* from Hayes.

August 23rd.—The President in the Chair.—Mr. R. Adkin exhibited a series of *Xanthorhoe galiata* from ova laid by an Eastbourne female, and pointed out a marked difference in tone of colour of the central band in a portion of the brood, and a series of *Coleophora lineolea* with their cases from larvae feeding on *Stachys lanata* growing in his garden border; Mr. T. H. L. Grosvenor, a unique and remarkable specimen of *Zygaena filipendulae* taken by him at Royston, with the right hind wing an almost exact duplication of the fore wing in size, marking, colour and neurulation; Mr. S. R. Ashby, an extremely melanic specimen of *Hadena dentina* (*nana*) taken by him at Oban; Dr. H. S. Fremlin, a plant of *Datura stamonium*; Mr. B. S. Williams, Coleoptera from Beds., including *Cassida fastuosa*, *Euconus denticornis*, etc., and *E. hirticollis* from Wicken; Mr. Enefer, several items of interest from Switzerland, *Polistes gallica* (Hym.), ♂ and ♀ of the Solitary Ant, *Mutilla europaea*, *Aromia moschata*, and several large species of spiders.

September 13th.—The President in the Chair.—Mr. H. Candler exhibited a collection of Rhopalocera captured in Natal during 1900–1–2; Mr. A. E. Tonge, the much retarded parasitised larva of a Zygaenid found at Lewes on September 9th, the Dipteran *Echinomyia grossa* bred from a larva of *Macrothylacia rubi*, a most abnormal and irregularly marked specimen of *Cleora jubata* (*glabraria*), etc.; Mr. Blenkarn, the Longicorn Coleopteron *Leptura rubra* from Norwich, new to Britain, and the local beetle *Zabrus gibbus* from near Brighton; Mr. O. R. Goodman, an *Epinephele jurtina* race *hispulla* having an irregular pale patch on the fore wing, and an *Argynnis niobe*

ab. *orientalis* of unusual size from S. France; Mr. T. H. L. Grosvenor, a number of the Indian *Kallima inachis*, and referred to the extensive range of variation of the underside leaf pattern and the invisibility when settled; Mr. Enefer, the large thistle frequenting *Cetonia* from Zermatt, the Longicorn *Saperda scalaris* from a tree trunk at Chamonix, and *Trichius fasciata* from knapweed heads at Zermatt; Mr. Carr, the larvae of *Stauropus fagi* from birch at Oxshott, of *Asthena blomeri* from Chalfont Road, and of *Leptomeris imitaria* from ova laid by a ♀ taken at Eynsford. Mr. Hy. J. Turner read a note on the melanic aberration of *Hadena dentina* recently exhibited, stating that it was named *latenai* in 1837 and was considered very rare in this country, and pointed out that by priority *nana*, Hufn. was the species name. He also exhibited a box of various species of *Erycinidae* from S. America, illustrating the most prominent genera.

September 27th.—The President in the Chair. Exhibition of Orders other than Lepidoptera.—Mr. W. J. Lucas exhibited coloured drawings of the rare orchid *Spiranthes aestivalis*, of the naiad and details of *Libellula quadrimaculata* (Odon.), and of the rare *Mecostethus grossa*, all from the New Forest; Mr. Priske, varied series of land-shells, mainly from Swanage and Littlehampton; Mr. Bunnett, ova of *Petrobia lapidum* (Myr.), new species of Orthoptera from Jamaica, and the Coleoptera, *Ceuthorrhynchus horridus*, *Coccinella conglobata*, etc.; Mr. H. W. Andrews, his collection of British *Tabanidae*, largely from Kent; Mr. B. S. Williams, numerous species of Coleoptera, mainly from Harpenden and Beds.; Mr. K. G. Blair, "Some Insects of the Sandhills," being notes on his holiday—mostly Hymenoptera and Coleoptera: *Megachile circumcincta*, *Coelioxys elongata*, *Andrena albicans*, *Psammophila hirsuta*, *Pompilus plumbeus*, *P. spissus*, etc. (Hym.), *Sitones grisea*, *Otiorrhynchus atroapterus*, *Philonthus gibbus*, *Crypticus quisquilius* (Col.), etc.; Mr. S. A. Blenkarn, some 40 species of local Coleoptera taken by him chiefly in 1921-3; Mr. S. R. Ashby, the very extensive and varied series of the Homopteron *Philoenus spinaria* collected by the late Mr. W. West; Mr. H. Moore, the three species of mole-crickets, *Gryllotalpa vulgaris*, Europe, *G. orientalis*, Africa, and *G. borealis*, America, and many Coleoptera from Nairobi; Mr. Main, a number of objects from S. France and the Eastern Pyrenees: *Mantis religiosa*, green and brown forms, *Empusa* sp., immature, *Chelidura dilatata*, an earwig with very curved forceps, an ant-lion, *Myrmeleon*, a salamander, etc.; Mr. Stafford, aberrations of *Agriades coridon*, from Royston; Mr. Tonge, *Agriades* f. *polonus*, considered a hybrid between *A. coridon* and *A. thetis*, from Reigate.—HY. J. TURNER (*Hon. Editor of Proceedings*).

It is with the deepest regret that we record the death of N. C. ROTHSCHILD. Time alone has prevented us from publishing now a fitting appreciation, which will therefore appear in our next number.—ED.

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[No. 727

CARCHARODUS ALCEAE IN SURREY.

By F. W. FROHAWK, F.E.S., M.B.O.U.

As will be remembered, in 1888 the late Mr. F. W. Hawes captured on the Essex coast three specimens of what he then considered to be varieties of *Adopaea thaumas*, and it was not until the following



Carcharodus alceae, Hüb., male and female.

year that they were identified as a distinct species known as *A. lineola* and the fact was first recorded in the Entomologist, January, 1890. It was, however, found out that many of the older collections contained examples of *lineola* mixed up with the series of *thaumas*. Therefore without doubt *lineola* has always been indigenous to this country. It has since been discovered in various localities, both inland as well as on the coast.

In the *Field*, Nov. 1, I recorded the occurrence of another species of the Hesperidae new to Britain, viz. *Carcharodus alceae*. Hüb., and published figures of the two specimens (here reproduced by kind permission of the *Field*), captured by my friend Baron J. A. Bouck in Surrey last June, when he wrote me saying: "I have taken two curious varieties of *tages*." I had the pleasure of seeing these shortly afterwards and identified them as *C. alceae*.

The following is a description of the Surrey examples : Male, expands 26.0 mm., female 30.0 mm. The male has the ground colour of the fore wings dull lilac, blending into greyish at the base, apex, and outer margin, the central area shot with lilac ; crossing the wing are two angulated median blackish bands composed of a series of irregular shaped spots, the largest occupying the centre of the discoidal cell, and having the outer edge bordered by a white triangular mark and two other white crescentic markings below in the middle of the wing ; also a white sub-apical streak divided into three spots ; the outer margin, including the fringe, consists of a series of elongated dusky markings intersected by whitish streaks. The sexual costal fold is open, forming a conspicuous bright ochreous furrow. The hind wings are chiefly black and grey, having only a slight lilac tinge, with two waved pale lines composed of whitish dots crossing the wing, one central, the other sub-marginal and running parallel to the outer margin, which, including the fringe, is conspicuously crenated with black and white, forming a series of long prominent conical projections. The antennae are strongly clubbed and are blackish above and whitish below ; the tips of the clubs are light-red. The female is similar in colouring but somewhat browner in hue, and the lilac rather duller ; the white spots on the fore wings are larger. The underside of both sexes is chiefly ochreous or golden-brown with greyish markings as above, but less distinct, but the whitish spots are more pronounced on the hind wings.

Abroad *alceae* has a wide geographical distribution, extending from France over central and southern Europe, North Africa, Western Asia and Siberia. Both in size and colouring it is very variable. Var. *australis* is smaller than the type and more uniformly coloured, being suffused with fulvous-brown. To Major P. P. Graves my thanks are due for kindly showing me his extensive and varied series of this species captured by himself in various localities abroad, throughout the spring, summer and autumn months, extending over a period from the middle of March to November 21st, the only break being from May 10th to early June. In its southern haunts there are three distinct broods.

I am indebted to Baron Bouck for giving me the opportunity of placing its capture on record. For this species I propose the popular name of the Surrey Skipper. Owing to its general resemblance to *tages* it is quite possible that *alceae* may have been previously overlooked and that specimens may exist in collections as aberrations of *tages*. As the Hesperidae are not migratory butterflies the occurrence of *alceae* in Britain is not caused by migration. Of course it cannot be said whether its appearance in Surrey resulted from accidental introduction. However, I do not think such was the cause under the circumstances, as the pair

were captured flying near plants of mallow, the food-plant of the larva, and both were apparently freshly emerged from the pupae, which makes it worthy to place the capture on record and add the species to the British list.

PERONEA HASTIANA, L. : ITS DISTRIBUTION, HABITS, LIFE-CYCLE AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from p. 252.)

(66) ab. **subdivisana** n. ab. (Plate 2, fig. 24.)

Synonymy.—Westwood, Brit. Moths, vol. ii, pl. xciii, fig. 7, and p. 156 (1845) (figured as *strigana* Stephens); Barrett, Brit. Lep. pl. ccccliii, fig. 1b (1905); Kennel, Pal. Tort. pl. iv, fig. 3, and p. 72 (1908) (*divisana*).

Ab. *subdivisana* differs from ab. *divisana* by the costal area being pale reddish brown instead of hoary white. It appears rarer than ab. *divisana*. I have four examples from Wimbledon, two from Wicken, one from the Isle of Wight, and one (the type) from Sligo.

It is my pleasant duty to thank those friends who have so kindly assisted me with material or advice, in the preparation of this paper.

To Mr. C. Turner-Clark I desire to tender my very grateful thanks for the beautiful photographs he has made; to Mr. J. Hartley Durrant for giving me the benefit of his unrivalled knowledge of Micro-Lepidoptera, especially in the solving of obscure problems in the difficult questions of nomenclature and synonymy; to Mr. W. Mansbridge, who has sent me year after year consignments of larvae from Lancashire and who has assisted me in other ways; to the Rev. J. W. Metcalfe, who has sent me many choice Devonshire forms for inspection and study; and to Mr. L. T. Ford, to whom I am indebted for many specimens from the Isle of Wight, and for the opportunity of studying his extensive series from that district.

The following is a complete list of the forms of *Peronea hastiana* mentioned in this paper, in the order they follow in it:

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| 1. <i>albana</i> , Sheldon. | 5. <i>mixtana</i> , Sheldon (Pl. 2, fig. 4). |
| 2. <i>albinaculana</i> , Sheldon (Pl. 2, fig. 1). | 6. <i>rufimixtana</i> , Sheldon. |
| 3. <i>costimaculana</i> , Wocke. | 7. <i>byringerana</i> , Hübner. |
| 4. <i>rufimaculana</i> , Sheldon (Pl. 2, fig. 3). | 8. <i>hastiana</i> , Linné. |
| | 9. <i>subhastiana</i> , Sheldon (Pl. 2, fig. 2). |

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| 10. subfasciana, Sheldon (Pl. 2, fig. 11). | 39. combustana, Hübner. |
| 11. rufifasciana, Sheldon (Pl. 2, fig. 12). | 40. scoticana, Sheldon (Pl. 2, fig. 10). |
| 12. metallicana, Sheldon (Pl. 2, fig. 9). | 41. griseovittana, Sheldon. |
| 13. variegana, Sheldon (Pl. 2, fig. 6). | 42. bivittana, Sheldon (Pl. 2, fig. 15). |
| 14. griseana, Sheldon (Pl. 2, fig. 7). | 43. mayrana, Hübner. |
| 15. scabrana, Schiff. | 44. fasciana, Sheldon. |
| 16. subscabrana, Sheldon. | 45. albovittana, Sheldon. |
| 17. veterana, Hübner. | 46. albostriana, Sheldon. |
| 18. obsoletana, Stephens. | 47. ochreovittana, Sheldon. |
| 19. subcristana, Stephens. | 48. rufivittana, Sheldon. |
| 20. coronana, Thunberg. | 49. fulvovittana, Sheldon. |
| 21. bollingerana, Hübner. | 50. subvittana, Sheldon (Pl. 2, fig. 16). |
| 22. autumnana, Hübner. | 51. brevivittana, Sheldon. |
| 23. transversana, Sheldon (Pl. 2, fig. 5). | 52. centrovittana, Stephens. |
| 24. plumbeana, Sheldon (Pl. 2, fig. 13). | 53. ramostriana, Stephens. |
| 25. albisparsana, Sheldon. | 54. striana, Sheldon (Pl. 2, fig. 17). |
| 26. irrorana, Sheldon. | 55. maculostriana, Sheldon (Pl. 2, fig. 20). |
| 27. aquilana, Hübner. | 56. ustulana, Sheldon (Pl. 2, fig. 18). |
| 28. flavicapitana, Sheldon. | 57. substriana, Sheldon (Pl. 2, fig. 19). |
| 29. nigrana, Sheldon. | 58. flavana, Sheldon (Pl. 2, fig. 21). |
| 30. brunneana, Sheldon. | 59. radiana, Hübner. |
| 31. pruinosa, Staudinger. | 60. brunneoradiana, Sheldon. |
| 32. psorana, Frölich. | 61. subradiana, Sheldon (Pl. 2, fig. 22). |
| 33. leucophaeana, Westwood. | 62. flavicostana, Sheldon. |
| 34. albistriana, Haworth. | 63. trivittana, Sheldon (Pl. 2, fig. 23). |
| 35. brunneostriana, Sheldon. | 64. divisana, Hübner. |
| 36. nigrostriana, Sheldon (Pl. 2, fig. 8). | 65. nigrodivisana, Sheldon. |
| 37. griseofasciana, Sheldon. | 66. subdivisana, Sheldon (Pl. 2, fig. 24). |
| 38. ochreofasciana, Sheldon (Pl. 2, fig. 14). | |

ERRATA AND ADDENDA.

ab. *costimaculana*, Wocke.

On page 128 there is an error in the interpretation of the German word "trapezförmigen." This should be taken to mean "a figure with two sides *only* parallel"; in the case of ab. *costimaculana* these are on the front (costal) and rear (inner) margins of the front wings. The form of the blotch referred to is clearly to be seen on Plate 2, fig. 1 = ab. *albimaculana*. The specimens I had seen, which I supposed to be this aberration, had the blotch triangular, but I have since seen some complying with the translation of this description, as amended above.

Hastiana, L.

British examples of the type form rarely *quite* agree with Linné's description or specimen. In these the only white marks are the transverse fascia, not quite extending to the inner margin of the front wing. In the vast majority of British examples having this particular fascia there is a small white blotch in the dark basal area, and a suspicion of another in the anal angle.

ab. *coronana* Thnbg.

I have at last been able to trace a British example of this aberration, the Rev. J. W. Metcalfe having one. It was bred from a Lancashire larva.

In the diagnosis of *Autumnana* Group on p. 177, the word pale should be omitted, the band not being lighter than the remainder of the superiors, with the exception of the dark costal blotch and shoulder mark.

On p. 77, line 3, the imagines of the first brood are stated to be smaller than those of the second. I find this is not universally so, for Mr. Metcalfe informs me that in Devonshire the specimens of the first brood are quite as large as those of the autumn emergence; he also states that in this county the autumn emergence is earlier than is the case further east, most of the examples appearing in September.

On p. 102, line 35, for "never" read "ever."

On page 200 in the synonymy of ab. *leucophaeana* Westwd. after (1847) there should be inserted the name (*signana*).

West Watch,
Limpsfield.
November, 1923.

TWO FURTHER CASES OF CO-ORDINATED RHYTHM IN INSECTS.

BY P. A. BUXTON,

Formerly Fellow of Trinity College, Cambridge; Medical Entomologist,
Government of Palestine.

THE publication of Mr. C. B. William's "Co-ordinated Rhythm in Insects, with a Record of Sound Production in an Aphid" (Entom., lv, pp. 173-176, August, 1922), brought to my mind an observation which I made some years ago and which I refrained from publishing, as I intended to consult the relevant literature before doing so. I have found it impossible to do this, and I now publish my observations in their crude form, hoping that I am not recording facts already well known to better-instructed entomologists.

On 18th June, 1917, I was at Freetown, Sierra Leone, and I climbed a hill between the golf course and the hill-station. At an altitude of perhaps 500 feet I noticed small numbers of winged termites emerging at 1 p.m. from a subterranean nest under stones in a shady place by the roadside. The ground round the mouth of the nest over a radius of 3 feet was covered with thousands of small soldiers and small numbers of large soldiers. All of these were making a rhythmical sound which resembled the noise made by sand falling on brown paper, and which was caused by tapping their heads on the dead leaves on which they were standing. The sound was produced in perfect time at a rate of about 48 beats per minute, and in the intervals between the beats there was complete silence. This remarkable performance was not disturbed by my collecting a considerable series of the performers, but an hour later when I passed the spot the emergence of winged adults had ceased, and not a soldier was to be seen above ground. My specimens were determined by Prof. F. Silvestri as *Acanthotermes militaris* Hag.

An instance of co-ordinated movement of a very different kind may be observed commonly in Palestine. The small larvae of an Arctiid moth, *Ocnogyna locwi* Z., may be observed in webs on the herbage in February and March, many scores together in one web. If the web is disturbed the larvae jerk the anterior halves of their bodies to right and left with a sharp flicking movement, all jerking simultaneously and maintaining the movement about twice a second for as much as 20-30 seconds. They then cease this movement and resume their feeding. It frequently happens that some of the larvae wander out of the web in search of food; these do not take part in the rhythmic movement even if they are within an inch or two of the web at a time when the larvae inside it are in movement. This suggests that the impulse to jerk is transmitted down the threads of the web; this is indeed the case, for if an elongated web (say 12 x 4 inches) is chosen for experiment and disturbed at one end the movement of the larvae in different parts of the web is not simultaneous. Waves of movement may be seen to travel through the mass of larvae from the point of disturbance, so that though the movement throughout the web is co-ordinated, it is not synchronous.

More mature larvae, which have finally left the web and are leading a solitary life, do not generally jerk themselves from side to side when disturbed: they roll up and drop. I have, however, occasionally seen jerking movements made by a large larva when another larva attempted to crawl over it. It seems therefore that the efficiency of the movement depends partly on its being performed by a number of larvae concertedly, but it is difficult to explain it as a defensive movement, for the small larvae are not only protected by their hairs like all Arctiids, but also by the web.

It seems clear that in the case of *Ocnogyna* the impulse to jerk is transmitted mechanically by the threads of the web, and received through the feet of those larvae which are clinging to the threads.

In the case of the Termite and Mr. William's Aphid the impulse is apparently auditory; at any rate it cannot be due to a mechanical vibration in the case of the termites standing on many different dead leaves over a considerable radius.

In all cases the latent period which intervenes between receipt of the stimulus and performance of the jerking movement must be a very short one.

Government Laboratory,
Jerusalem,
Palestine.

A NEW PAPILIO FROM THE PHILIPPINE ISLANDS.

(Lepidoptera, Papilionidae.)

By J. J. JOICEY and G. TALBOT.

Papilio benguetana, sp. nov.

THIS very interesting discovery is based upon a single specimen received by Mr. P. I. Lathy, from Luzon, and now in the Collection of the Hill Museum. It is most closely related to *Papilio xuthus*, a common species in Japan, Corea, E. China, though not reaching Hong Kong, in the Liu Kiu and neighbouring islands, and in Formosa; less common in Amurland, and extending to Upper Burma, the Bonin Islands, and Guam, but not in the Philippines. The present species has very much the appearance of a considerably modified derivative of *P. xuthus*, with which, in the following description, it is compared.

♂. Wings more rounded, especially the hind wing, and tails a little shorter and thinner. *Upperside*: *Fore wing* with the cell bar straight and more oblique, discocellular bar obsolete. The stripes in cellules 4 and 5 are represented by dots, the short stripe in 6 does not bear a black dot, the similar stripe in 7 is only represented by its proximal half, and the spot above it is longer than in the typical form. Submarginal spots smaller, the two apical ones represented by points. *Hind wing* with the yellow stripes narrower than in the typical form, those in cellules 5 and 6 especially longer and narrower. No black costal patch, this patch also absent in some specimens of the typical form. Post-discal lunules formed of pale yellow scales without a trace of blue, this being also the case occasionally in some specimens of the typical form. Submarginal lunules very narrow, the middle two orange and the others, excepting the apical one, with slight orange tinge. Anal ring orange and narrow.

Underside: *Fore wing*, with the spots in 4 and 5 more strongly developed, also the stripes above them. Post-discal transverse stripe

strongly marked and reaching vein 3. Submarginal spots all free, their inner edges rounded, apical spot larger than the one below it. Black marginal border narrower. *Hind wing* with stripes more strongly developed than above. Post-discal lunate patches pale yellowish with a tinge of orange; no blue tinge except the anal mark, which is pale blue. The distal ends of median stripes in 3 and 4 are without the orange patch and show only a faint orange tinge. A submarginal row of well-defined lunules tinged with orange, much larger than those on the upperside and quite different from the spots found in the typical form. The yellow stripe at the apex bears a round black spot, and the black bar next to it bears a few bluish scales.

This distinctive species appears to partake of some of the characteristics of both the summer (*xuthus*) and the spring (*xuthulus*) forms of *Papilio xuthus*. In size it resembles the latter.

Hab.—North Luzon, Benguet District, taken on the peak of Santo Tomas.

STUDIES AMONG THE AMERICAN GALERUCIDAE (COL.).

BY F. C. BOWDITCH.

(Concluded from p. 258.)

Luperodes notatus sp. nov.

Small, testaceous; eyes and antennae (except the base), the shoulder, the lateral margin and suture, and a large rather post-median oblong spot, as well as the tibia and tarsi, black; the humeral spot is joined to the margin, and also in one specimen the discal spot; the apical black margin is broadened and the region of the suture is the same.

Type: 1 Caracas, Venezuela, 1 Venez. (2nd Jac. Coll.). Length 3 mm. (Coll. Bow.).

Head with well-marked transverse sulcation and very fine punctuation; antennae nearly as long as body, fuscous, 3 joint slightly longer than 2; thorax with slightly rounded sides and finely punctate surface and fairly well-marked transverse depression, especially at the sides; elytra more thickly and much more coarsely punctate than the thorax.

Luperodes lineatus sp. nov.

Large sized; head and thorax (except the edge) black; antennae black (except joints 2-4 and 8-11 flavous); elytra flavous, with a black submarginal and subsutural vitta (not attaining the apex); body below flavous with black breast; legs testaceous, with tibiae and tarsi darker.

Type: 1 example, Boliv. (green label) Chaco? Length 6 mm. (Coll. Bow.).

Head with transverse impression and a few fine punctures; antennae reaching beyond the middle of the elytra: joint 3 longer than 2; thorax with nearly straight sides, very finely punctulate and obsoletely depressed and also basal indentation on each side; elytra widened behind, very thickly and finely punctured; the sub-sutural vitta curves outward at its posterior third; the submarginal has a slight widening near its posterior end, indicating a possible junction in some examples. The type (♀ ?) has a deep fovea on the last ventral segment; easily known by its coloration.

***Luperodes binotatus* sp. nov.**

Medium sized, black, antennae at base and apex; the thorax, a round subbasal spot and a submedian transverse spot not attaining either the suture or margin, flavous beneath, flavous with the breast, and tibia and tarsi black.

Types: 3 examples, Peru (green label), Marcapata? Length $4\frac{1}{2}$ mm. (Coll. Bow.).

Head with fairly marked depression and a few minute punctures; antennae reaching just beyond the middle of the elytra; 3 joint twice as long as 2 (♀ ?), half as long (♂ ?), the basal and joints 5-8 and half of 9 black; thorax with nearly straight sides, surface with scattered fine punctures, depression obsolete; elytra thickly and finely punctured; the transverse spot is slightly oblique and indications are that it may be at times two separate spots; hind tarsal joint very elongate; the last ventral segment of what seems the ♂ is broadly longitudinally sulcate; somewhat resembles *bianmularis* Jac., from Chiriqui, but is double the size and the flavous marks differently placed.

***Luperodes angustofasciata* sp. nov.**

Large sized, head black, antennae with base and middle dusky, thorax and scutel flavous, elytra cyaneous blue; margin (narrowly at base, broadly at tip) a slightly submedian transverse band, and a short stripe running from the latter to the base just within the shoulder, yellow; body below and legs yellow, with breast and tibiae and tarsi brownish black.

Type: 3 examples, Peru, Marcapata (green label). Length 6 mm. (Coll. Bow.).

Head with deep transverse sulcus and very fine punctuation; antennae with the basal joint and 4-7 more or less dark brown, the relative length of the joint 2, 3 differing according to sex as in *binotatus* supra; thorax with slightly rounded sides, surface finely sparsely punctulate and semi-obsolete depression; elytra widened towards the tip, thickly and finely punctate; the light coloured margin anteriorly is confined to the reflexed edge, but it is broad at the tip. The markings easily distinguish this large form.

Luperodes apicalis Jac. was described from Guatemala, and its yellow elytra with apical portion black easily identifies it. Specimens occur from Caracas which I refer to this form; one has the elytra almost wholly testaceous, the others with the black part much widened and considerable black beneath. It may well be a different form as none occur in the intermediate territory, though one specimen from St. Catharina is very like the typical *apicalis*.

The genus *Elyces* was established by Jacoby in the *Biologia*, p. 612, to receive four small forms occurring in Central America. Among the salient points are the very long antennae and the clypeus not separated from the face. A fifth species occurs in Ecuador.

***Elyces rosenbergi* sp. nov.**

Small, flavous, antennae fuscous; mouth, vertex of head or neck a somewhat irregular longitudinal vitta occupying nearly the whole of the elytra; the breast and most of the abdomen black; elytra sparsely greyish pubescent.

Type: 1 example, Cachabó, low c., xi. 96, Rosenberg. Length 3 mm. (Coll. Bow.).

Antennae very slender, much longer than the body, clypeus and front forming one continuous piece with scattered stiff hairs; thorax transverse, nearly smooth, extremely finely punctulate; elytra parallel, closely and comparatively coarsely punctured; the colour of the elytra might well be described as black with the outside and sutural edges yellow, this light colour widened at the middle, showing a tendency to divide the black band into two spots (a form which probably occurs).

Undoubtedly other species of this genus will occur in the northern part of South America as the fauna becomes better known.

***Metacoryna acobyi* sp. nov.**

Very large (for genus), orange yellow, head cyaneous, scutellum black, elytra and body below cyaneous; antennae ♂ joints 8, 9, very strongly dilated, pear-shaped, 10, 11 black.

Type: 1 ♂ example, Sierra de Durango. Length 8 mm. (Coll. Bow.).

Head nearly smooth with a deep frontal fovea; antennae with joints 5, 6, 7 shortened and thickened, 8, 9 enormously dilated and concave below, 10, 11 elongate; thorax quadrate, sides rounded, widest just before middle, surface smooth and polished; elytra finely, closely punctate. Very much the largest of the described forms, all of which seem to be represented by ♂'s only.

A STRIKING NEW LYCAENID FROM ST. VINCENT,
B.W.I.

By W. J. KAYE, F.E.S.

Thecla burdi n. sp.

♂.—*Fore wing* without any brand, rich dark coppery-brown. The broad outer margin dull dark blackish brown. *Hind wing* dark coppery-brown with a black round spot on margin between veins 2, 3. On inner side of this marginal spot is an orange patch. *Underside* of fore wing grey-brown with a straight double linear spotted line from costa to vein 2. Inwardly this line is blackish and outwardly whitish. An indistinct dark marginal line most distinct in centre. Underside of hind wing grey brown with a black edged interiorly, white line from costa to inner margin, deeply angled before termination. Large black spots at tornus and between veins 2, 3 on margin. The latter surrounded interiorly by a large red irregular patch almost meeting the white transverse line. A dark submarginal line meeting the white transverse line at vein 2. A conspicuous clouded marginal white line as far as vein 6.

Habitat.—St. Vincent, B.W.I., May and September, 1922 (*L. H. Burd*).

The species strongly recalls *Thecla acis*, but is removed from that widely spread species and probably belongs to another genus.

“Caracas,”

Ditton Hill,

Surbiton.

THREE NEW MICRO-LEPIDOPTERA FROM CYPRUS.

By E. MEYRICK, B.A., F.R.S.

AMONGST some insects from the island of Cyprus recently submitted to me by Capt. Kenneth J. Hayward for identification were the following, which I consider undescribed. Capt. Hayward very kindly permitted me to retain the types.

Alucita phaeoschista n. sp.

♂ ♀. 19–21 mm. Head whitish. Palpi white, a dark grey lateral streak. Thorax whitish-yellow, patagia ochreous-tinged. Abdomen yellow-whitish, fine grey dorsal and lateral lines. Fore wings cleft to before middle, segments very slender; whitish, partially tinged pale brownish-ochreous, towards apex of segments white; costal edge finely dark grey from towards base to a slightly thickened dark elongate mark beyond fissure; a thick streak of grey subdorsal suffusion on basal fourth; a more or less indistinct fine greyish line beneath costa towards base; a grey line along middle of first segment,

obsolete towards apex, sometimes confluent with a thickened dark grey line along costa from $\frac{2}{3}$ to near apex: a more or less developed irregular elongate patch of grey suffusion before fissure: cilia grey, on costa white, on upper margin of second segment mixed whitish towards apex. Hind wings and cilia grey, third segment whitish towards base.

Platres, 5000 feet, in July; five examples.

***Peronea aphorista* n. sp.**

♀. 14 mm. Head and palpi whitish-ochreous-grey. Thorax grey. Fore wings elongate-oblong, costa gently arched anteriorly, termen slightly rounded, hardly oblique; light greyish-ochreous, sprinkled whitish and irregularly mixed with pale reddish-brown suffusion, a few scattered black specks, costa more greyish-tinged; six small cloudy dark fuscous spots on costa between $\frac{1}{3}$ and apex, first four united in a triangular blotch of dark grey suffusion reaching more than half across wing; a moderate tuft in disc before edge of this blotch, another rather posterior beneath its apex, and one near dorsum towards tornus: some irregular grey suffusion sprinkled dark grey on dorsal half about $\frac{1}{4}$, a moderate tuft in this on fold; a small tuft towards costa at $\frac{1}{4}$: cilia pale grey with rows of whitish points, towards base mixed darker. Hind wings dark grey: cilia pale grey, basal fourth grey.

Platres, 5000-6000 feet, in September; one example.

***Depressaria rhodochlora* n. sp.**

♀. 17 mm. Head and thorax ochreous-whitish. Fore wings elongate; 2 remote; pale rosy-ochreous: cilia rosy-whitish-ochreous, more rosy-tinged basally on tornus. Hind wings with 5 nearly approximated to 4 at base; grey-whitish: cilia whitish.

Platres, in July; one example. A singular species, quite unlike any other; the palpi are missing, but it is undoubtedly a true *Depressaria* of the *pulcherrimella* group, narrower-winged than usual, and possibly most allied to *ruticola*.

Thornhanger, Marlborough;
April 23rd, 1923.

NOTES AND OBSERVATIONS.

MIGRATION OF PYRAMEIS ATALANTA. — Baron J. A. Bouck informs me he observed on October 6th at 2.30 p.m. a large flight of *P. atalanta* on migration. While strolling down a long grassy path in his garden in Surrey, bordered on either side by a varied growth of plants, including masses of Michaelmas daisies, he suddenly noticed what at first sight appeared to be a shower of leaves floating along in the S.W. breeze, but was surprised to find they were a swarm of *atalanta* numbering 200 or more individuals as well as could be estimated. A

large number flew down and settled on a clump of the flowers. Having a net at the time he captured four with one short sweep; the others rose and followed the main body of the swarm and all quickly disappeared flying in a north-easterly direction. Although its nearly *P. cardui* migrates in companies, sometimes in vast swarms, *atalanta* is not known to migrate in any numbers. Usually they arrive in this country either singly or in small detachments, and upon reaching our shores at once disperse over the country. Therefore the flight as witnessed by Baron Bouck was a remarkable occurrence, especially as it occurred so far inland.—F. W. FROHAWK.

POLYGONIA C-ALBUM IN CHESHIRE.—I took a newly-emerged specimen of *P. c-album* on Oct. 1st in a garden on Hough Green, Chester. It was flying over some fallen, rotting apples and a clump of Michaelmas daisies. The Comma rarely occurs in Cheshire, and though formerly common at Malpas and more recently at Ince only odd autumn specimens are now taken in the county, and then only every few years.—A. M. CHEETHAM; 46, Hough Green, Chester.

VANESSA IO REARED FOR VARIETIES.—One hundred and fifty larvae of *Vanessa io* were collected during July here (Chichester) by our neighbour and friend Mrs. Humphry, and reared by her in the hope of obtaining varieties, or aberrations. Of these one hundred and thirty emerged in perfect condition; but out of this large number not one differed in the least from the typical form. One, however, was very small. All of them were released.

Mrs. Humphry was fortunate in securing an aberration of *Vanessa io* in which "the eye-spots on the fore wings are replaced with a white suffusion." The insect flew into her bed-room. The capture is recorded in Entom., vol. xlviii, p. 245.—JOSEPH ANDERSON; Chichester.

MACROGLOSSA STELLATARUM IN OCTOBER.—My son took this moth on Oct. 20th last at Delphinium in my garden. This is the first time I have heard of this insect so late in the year in this district, which is so near London. The insect is in perfect condition.—SYDNEY ABBOTT; 110, Inchmery Road, Catford, Kent.

NOTES ON THE FOOD OF ABRAXAS SYLVATA, ETC.—I believe that this moth is considered to be almost, if not entirely, a feeder on wych elm; I have, however, obtained the imagines from pupae dug at the foot of oaks, and in autumn I have seen the larvae descending for pupation on oak, beech, sycamore and ash, in addition to wych elm. I think that the insect is probably much more catholic in its tastes than is generally supposed, and that provided that there are enough wych elms in a wood to attract it to the spot, it will probably feed on any or all of the trees that it finds there. In this connection I may mention that I have found the wingless females of *Apocheima hispidaria* on sycamore and wych elm as well as upon oak, and that in this district wych elm is the most favoured tree. There are no oak woods in my immediate neighbourhood, and the wood in which I take the species is chiefly composed of wych elm and beech, with, however, a fair sprinkling of oaks. While visiting this wood last March, my attention was drawn to an insect crawling rather rapidly up a beech a few yards distant; by the time I reached

it, the insect, which proved to be a freshly emerged female *Anisopteryx aescularia*, had reached the height of my face and therefore I promptly boxed it. Not until this was accomplished did I notice a male of the same species motionless and at rest about eighteen inches higher up the tree, and towards this male the female had been crawling. An isolated instance of this kind offers little more than a mere suggestion, but still it seems to me that it does suggest the question whether these wingless females, in spite of their simple antennae, can discover and make their way to the males.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

SYMPETRUM FONSICOLOMBII, COLIAS CROCEUS, ETC., IN CORNWALL.—During the first week of August, 1923, the dragonfly *Sympetrum fonsicolombii* occurred on a marsh near here. I took one, a male, which was kindly verified for me by Mr. W. J. Lucas, B.A. Several other males were present on the same occasion. *Colias croceus* appeared sparingly at many places in the county for about a week or so during the middle of September and at the same time *Caradrina exigua* came to sugar and light. LEONARD B. HOPPER, F.E.S.; Manor House, Penryn, Cornwall, November 5th, 1923.

LATE DATES.—On the 28th October I caught in Epping Forest a male *Aeschna cyanea* (Odonata). The specimen was not quite mature, having still a large amount of green on the body.

On the same day I saw but did not catch a male *Orqyia antiqua*, sitting on the trunk of an oak tree. It was quite perfect. Kirby mentions a second brood as emerging in October, but this is the only specimen I have seen at so late a date.—D. G. SEVASTOPULO; 147, Gloucester Terrace, W. 2.

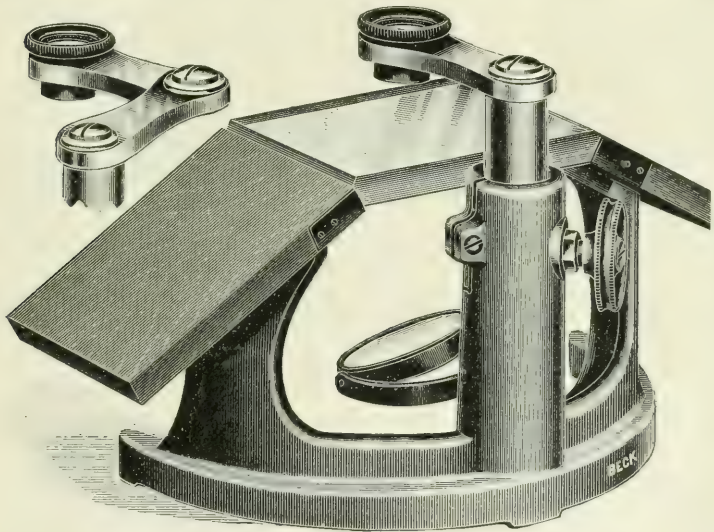
AESCHNA JUNCEA REARED FROM THE NYMPH.—From five nymphs got from the canal at Byfleet in April last I reared four *Aeschna juncea* (♀) in the first ten days of July, the remaining nymph dying mysteriously not long before it was due to emerge. I have been getting dragonfly nymphs from this canal at Byfleet every year for at least fifteen years and have never before taken this species. Curiously I got no *Ae. grandis* this year, which I had before obtained in some numbers from this canal year after year. The nymphs of *Ae. juncea* were very like *Ae. grandis*, but I did not think they were either *grandis* or *cyanea*. They seemed longer and less robustly built than *grandis*; but I was not sure what they were until the dragonfly appeared (I am speaking only of general external appearance). It is a very fine insect, the gold costa to the wings giving it a very striking appearance.

I have also reared *Cordulia aenea* and *Cordulegaster annulatus* this year.—HAROLD HODGE; 9, Highbury Place, N. 5, November 7th, 1923.

HYPOCALA ANDAMANA (LEP. NOCTUIDAE).—Hampson, in Cat. Lep. Phal., vol. ined. Noctuidae, MSS. no. 2159, includes *Hypocala lativitta* Walker (Cat., xxxiii, p. 929, 1865) as a synonym of *Hypocala guttiventris* Walker (Cat., xiii, 1176, 1857). There is, however, another quite distinct species of *Hypocala* also named *lativitta* by Moore (Proc. Zool. Soc. Lond., p. 606, pl. 60, fig. 4, 1877) which is catalogued by Hampson in

Cat. Lep. Phal., vol. ined. Noctuidae, MSS. no. 2158. The name of *lativitta* Moore must therefore sink and be superseded by the new name *andamana*, as it is already preoccupied by *lativitta* Walker. The male type of *lativitta* Moore comes from the Andaman Islands.—A. E. WILEMAN.

A NEW DISSECTING MICROSCOPE.—The great gain in the stability of the instrument when in use is the chief advantage claimed for this latest of Messrs. R. & J. Beck's microscopes. Lack of stability and firm support for the wrists are perhaps the two most tiring factors when dissections under the microscope are constantly to be done. Messrs. Beck's new stand would appear to overcome these difficulties.



The wide and solid base, carrying securely attached arm rests, are clearly shown in the accompanying figure, and look very comfortable. Prices range from £3 6s. 6d. to £10 15s. 6d.; and the instrument can be used as a compound microscope either of the erecting or inverting type by attaching either of the microscope bodies supplied for the purpose, and in these any standard object glasses or eyepieces can be used.—N. D. R.

RECENT LITERATURE.

Across the Great Craterland to the Congo. By T. A. BARNES. Pp. 276. 82 Plates, 2 Maps. London: Ernest Benn, Ltd. Price 25s.

THE main entomological interest in this well-illustrated narrative centres round the object of the prolonged expedition of which Mr. Barnes here gives us so attractive an account. On a previous visit to

the Congo Mr. Barns had himself seen on the wing a single specimen of an exceedingly large unknown swallow-tail butterfly, but in spite of strenuous efforts was unable to capture it. It is described as having roughly the fore wings of *Papilio antimachus* and the hind wings of *P. zulmaris* (c. Bulletin Hill Museum, vol. i, No. 1, p. 39, 1921). The keenness of Mr. J. J. Joicey made possible this journey, the avowed purpose of which was to secure specimens of this particular butterfly. Starting in from Mombasa the author takes us *via* the Giant Craters, chief among which is Ngorongoro, through Tanganyika Territory to Bafwasende in the Belgian Congo. Arrived here, he tells us how he settled down to collect in earnest, how he organised patrols on land and water, trained collectors and offered rewards, but all in vain. Although a wonderful bag of Lepidoptera was got together, the "Antizox," as he calls the mysterious butterfly of his search, never turned up. Concluding he was not in the right neighbourhood he moved on again, making light of the difficulties and discomforts of the journey, which, after many vicissitudes, was eventually to carry him and Mrs. Barns, his companion throughout the trip, to the Cape, sadly disappointed at having failed to gain the object of their journey, but the richer for the large collections of Lepidoptera now in Hill Museum, to say nothing of the other zoological specimens, many of them now in the Natural History Museum at South Kensington. The author does not attempt to confine himself in his narrative to Entomology, but touches on a variety of interesting subjects, so that the reader gathers an excellent picture of the regions, some of them quite unexplored, through which he travelled. One only regrets, on laying down the book, that there isn't more of it. N. D. R.

Adventures Among Bees. By HERBERT MACE. Pp. 144. 19 Illustrations. London: Hutchinson & Co., 1923. 4s. 6d.

MANY bee-keepers will no doubt see themselves and their experiences all over again in these pages. Mr. Herbert Mace displays a very wide knowledge of his subject gained from personal observations and records. He has the all too rare propensity for finding things out for himself. His remarks on the relationship between bee activity, honey-flow and climatic conditions, illustrated graphically, are especially interesting. His experiences cover a number of years, including those in which the Isle of Wight disease played havoc with so many hives, and are only interrupted by his absence during the war. In this book he gives us the conclusions he has arrived at on innumerable questions, producing a work both instructive and suggestive. N. D. R.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 3rd, 1923.* Mr. E. E. Green, President, in the Chair.—*Gifts to the Society.*—The Treasurer called attention to the ten new portraits added to the Society's collection and now hung on the walls of the Meeting Room, including one of the late Secretary, Mr. H. Rowland-Brown. Miss Rowland-Brown, who was present as a visitor, addressed the Meeting and expressed her thanks for the honour

conferred on her late brother. *Russian Entomological Society*.—The Secretary read a letter from the Russian Entomological Society thanking the Society for the financial help sent to Russian entomologists in distressed circumstances. *Exhibitions*.—Mr. A. E. Tonge exhibited *Agriades bellargus* ab. *polonus* Zell., and expressed the opinion that it is a hybrid between *corydon* and *bellargus*. Mr. Donisthorpe exhibited some rare British beetles including *Arena octavii* Fauv., and *Cryptophagus schmidtii* Strm. Mr. G. T. Bethune-Baker, on behalf of Dr. Jefferis Turner, exhibited a remarkable Australian Oecophorid, *Neossiosynoeca scatophaga*, living in parrots' nests. The Rev. F. D. Morice exhibited an example of the sawfly *Pachyprotaxis rapae* L., with the tarsi, etc., of one leg duplicated. Dr. K. Jordan exhibited some remarkable Lepidopterous cocoons from South America. Mr. T. H. L. Grosvenor exhibited a teratological specimen of *Zygaena filipendulae*. Mr. H. M. Edelsten exhibited a series of varieties of *Arctia villica*. Prof. E. B. Poulton, F.R.S., exhibited a remarkable Lepidopterous leaf-miner from South Nigeria. The Rev. G. Wheeler exhibited examples of *Agriades polonus* Zell., and also, on behalf of Mr. Prideaux, both sexes of the second brood of *A. hispana* Hs., reared from eggs sent from Florence. *Papers*.—The following papers were read: (1) On Scent Organs in the Genus *Hydroptila* (Trichoptera), by Mr. Martin E. Mosely. (2) Coleoptera from the Seychelles, Lampyridae, Helodidae, Cantharhidae, Melyridae and supplement to Cleridae, by Mr. G. C. Champion. (3) The Dragonflies (Order Odonata) of Fiji, with Special Reference to a Collection made by Mr. H. W. Simmonds, F.E.S., in the Island of Viti-Levu, by Dr. R. J. Tillyard.

Wednesday, October 17th, 1923.—Mr. E. E. Green, President, in the Chair.—*Obituary*: The Chairman announced the death of the Hon. N. C. Rothschild, a former President of the Society, and a vote of condolence with his relatives was passed. A vote of condolence with Mr. G. T. Bethune-Baker on the death of Mrs. Bethune-Baker was also passed. *Election of Fellows*.—The following were elected Fellows of the Society: Mr. S. N. Chatterjee, Forest Research Inst., Dehra Dun, U.P., India. Mr. J. H. Hutchinson, M.A., Challoner House, Cockermouth. Mr. G. L. R. Hancock, Trinity College, Cambridge. *Exhibitions*.—Mr. P. A. Buxton made some remarks, illustrated by diagrams, on Heat, Drought and some Desert Insects. Mr. N. H. Joy exhibited a number of insects found in bats' dung, and also some rare beetles taken at Windsor associated with the ant, *Acanthomyops brunneus*. Mr. L. W. Newman exhibited a supposed hybrid between *Polyommatus thetis* and *P. icarus*, and other Lycaenids. Mr. T. H. L. Grosvenor exhibited a number of abnormal specimens of *Zygaena* spp. Mr. A. E. Tonge exhibited a female variety of *Cleora glabraria* from the New Forest. Rev. G. Wheeler exhibited a remarkable form of *Parnassius apollo*. Mr. P. Harwood exhibited living examples of *Pytho depressus*. Mr. A. Dicksee exhibited rare butterflies from Formosa and S. America. Prof. E. B. Poulton, F.R.S., exhibited a female of *Hypolimnias wahlbergi* bred from a captured female from the same form at Durban. Also a remarkable variety of the dry-season form of *Precis octavia sesamus* from Nairobi and photographs of Ascalaphid larvae from the same place. Dr. G. D.

Hale Carpenter exhibited and made some remarks upon a number of butterflies from the Semliki valley, Western Uganda. Dr. F. A. Dixey, F.R.S., discussed the disappearance of cryptic patterns in butterflies during flight, and exhibited some examples of Pierines to illustrate his remarks. The following papers were read: (1) On the Early Stages of *Chrysidia ripheus*, by Dr. H. Eltringham. (2) On the Tympanic Organ in *Chrysidia ripheus*, by Dr. H. Eltringham. (3) On the Genitalia in *Sabatinca* and Allied Genera (Lepidoptera homoneura), with Some Observations on the Same Structures in the Mecoptera, by Mr. A. Phillpott. (4) On the African Species of the Dynastid Genus *Heteronychus*, by Mr. R. W. Jack.—S. A. NEAVE, *Hon. Sec.*

OBITUARY.

THE HON. NATHANIEL CHARLES ROTHSCHILD.

It was with the deepest regret we announced last month the death of the Hon. Nathaniel Charles Rothschild, M.A., which took place at his country seat, Ashton Wold, Northamptonshire, on October 12th last, at the age of 46. Born May 9th, 1877, and younger son of the first Lord Rothschild, he was educated at Farnborough Preparatory School, and from there went to Harrow in 1891 and to Trinity College, Cambridge, in 1895. His name was entered on the rolls of the students of medicine, and he took his B.A. degree in Natural Science in 1898 and M.A. in 1901.

Leaving Cambridge he entered as a partner in the firm of Messrs. N. R. Rothschild & Sons, New Court, St. Swithin's Lane, where he assiduously devoted himself as a keen business man, but nevertheless did not slacken in his study of biology, in which he took the greatest interest, especially in entomology, having collected insects since early boyhood. At the age of 18, together with the late Louis Bonhote, he published, in 1895, a volume on The Lepidoptera of the Harrow district. Being an ardent collector both in this country and abroad he formed an extensive collection of Lepidoptera, especially rich in Hungarian species, mostly of his own capturing. He paid many visits to Hungary and studied the Lepidoptera and Flora of different districts, chiefly in the Bihar Comitatus. It was near Csételek that he captured examples of *Argynnis laodice* in August, 1907, and obtained from four females a large number of eggs. These he kindly sent the writer for the purpose of working out the life-history of this rare species, which was successfully carried out for the first time, the detailed account, with a coloured plate of its complete life-cycle, being published in this Journal (March, 1909, vol. xlii, pp. 49-54). The life-history of another rare species, *Melanargia japygia* subsp. *sucarorius*, was also successfully worked out from eggs laid by the butterflies captured at Pusztaszer in Western Hungary (*The Entomologist*, vol. xlv, pp. 1-5, 1912; vol. xlvi, pp. 275-278). Many other contributions to this Journal from Mr. Rothschild extend over a large number of years. He was likewise a frequent contributor to other scientific journals, among which may be mentioned his Contributions to the Knowledge of the Siphonaptera in *Novitates Zoologicae*,

vol. v, 1898, followed by several other similar papers in subsequent volumes. These dealt mostly with descriptions of new species in the author's collections and were accompanied by plates. As an authority on the *Siphonaptera* and other blood-sucking Ectoparasites his name will always remain. His attention was first drawn to this group of insects through some slides acquired from a dealer when a schoolboy, when he started collecting. At first this was more of a hobby, but later the discovery of the transmission of diseases by blood-sucking insects rendered their study of great practical importance. Mr. Rothschild therefore systematically set to work and specialised in fleas, bed-bugs and some minor groups. His skill in organisation resulted in the accumulation of a mass of material from all parts of the world, by which means he acquired a number of new species which were described in various scientific works and many genera monographed. His collection of fleas in the Tring Museum is by far the finest in the world: it numbers about one hundred thousand specimens.

During his two trips to Egypt and the Sudan he discovered the rat-flea (*Xenopsylla cheopis*), which subsequently proved to be the chief agent in the transmission of bubonic plague from rat to man. This flea readily attacks man, and is so partial to his blood that it has been kept alive for three weeks on this diet. The minute study of the fleas resulted in the exact discrimination between closely allied species. In the British Islands forty-six distinct species have been found, but some are of great rarity, such as *Ceratophyllus borealis*, of which only one specimen was for some time known (in the Tring Collection). It was obtained from a gannet, but subsequently found parasitical on the rock-pipit in the Shetlands. Other rare species have been found on sea-birds.

The knowledge of the existence of several rat-fleas in India, differing in habits and distribution, explains why some districts in India are free from plague. Dr. Hirst, writing on the transmission of plague by fleas, says: "The advances made in our knowledge of the epidemiology of plague are the direct result of the labours of two workers, namely, the Hon. N. Charles Rothschild and Dr. Karl Jordan, who for many years have devoted themselves in a purely scientific spirit to the study of zoology."

The collection of ectoparasites was presented by Mr. Rothschild to the Trustees of the British Museum some years before the war, with the proviso that it should remain in his hands during his lifetime. He also set apart a sum of money, the interest of which was to be applied for the appointment of an assistant and for the upkeep of the collection. The publication of a descriptive illustrated catalogue for the use of the research workers in tropical medicine was contemplated and the preliminary work begun.

Being an ardent field naturalist, collector, and a great lover of all Nature, Mr. Rothschild perceived that there were two points of primary importance in every country. First, a thorough exploration of the country in order to ascertain what animals and plants occurred, and which were common and which were rare or localised. Secondly, to devise means of protecting the rare or local forms from extinction in consequence of the cultivation of the ground or excessive collecting. The Imperial Bureau of Entomology, now an institution

of the greatest practical importance, and the Society for the Promotion of Nature Reserves, both, at their inception, owed a very great deal to Mr. Rothschild's initiative, and the latter society was almost entirely financed by him and receives from him a legacy of £5000. It was not only the fauna of this country that attracted his attention, but in botany also he was deeply interested, and he did not confine himself to the British flora only. His gardens at Ashton Wold are rich in a variety of choice foliage and flowering shrubs and plants, including a very fine collection, with full data of localities, of the *Iridaceae*—an order in which he specialised.

Mr. Rothschild's collection of both British and Hungarian Lepidoptera are to remain at his London residence, Arundel House; the remainder will be added to the Tring Museum, while the *Ectoparasites* will be kept at Tring until the completion of the descriptive catalogue by Dr. K. Jordan of all the known *Siphonaptera*, when the collection will then be moved to the British Museum. Also the Authorities of the British Museum can select 100 specimens of *Lepidoptera* from the collections.

To the Entomological Society of London, we understand, Mr. Rothschild has bequeathed £1000. He was President of the Entomological Society in 1915 and 1916, Fellow of the Linnean Society and of the Zoological Society, also of other scientific societies both of this country and abroad, and a member of the British Ornithologists' Union. He was a Justice of the Peace and High Sheriff for Northamptonshire in 1905. In 1907 Mr. Rothschild married Rozsika, daughter of Capt. Alfred von Wertheimstein, of Hungary, who with a son and three daughters survive him. During the early part of the war he was in close connection with, and doing most important work for several Government departments, and when, after the death of his father in the spring of 1915, he took over the various duties of his father as well, the strain became very severe, and the overwork resulted in a nervous breakdown in 1916 from which he never completely recovered.

His funeral took place at the United Synagogue Cemetery, Willesden, on October 14th. Mr. Rothschild was a man of exceptional personality, a lover of all nature and a keen field naturalist, of simple taste and refined accomplishments, generous, just, and of a highly sensitive and kind disposition. By all, and especially those as intimately acquainted with him as the writer of these lines, the loss of his friendship will be keenly felt. A gap has been made in scientific research which cannot be filled. To his bereaved family we tender our deepest sympathies.

F. W. F.

THE LEPIDOPTERA OF THE MADEIRA ISLANDS.

WITH regard to the paper by Prof. T. D. A. Cockerell published under the above title in this magazine last month, Mr. J. H. Durrant has called my attention to the fact that "*Euscelis*" (p. 247) should be "*Eucelis*." He also tells me that "*Tinea fuscipunctella* and *Apatema fasciatum* have already been recorded from Madeira, but *Hieroxestis suberrinella* and *H. praematura* should be noted as new to the islands."—N. D. R.

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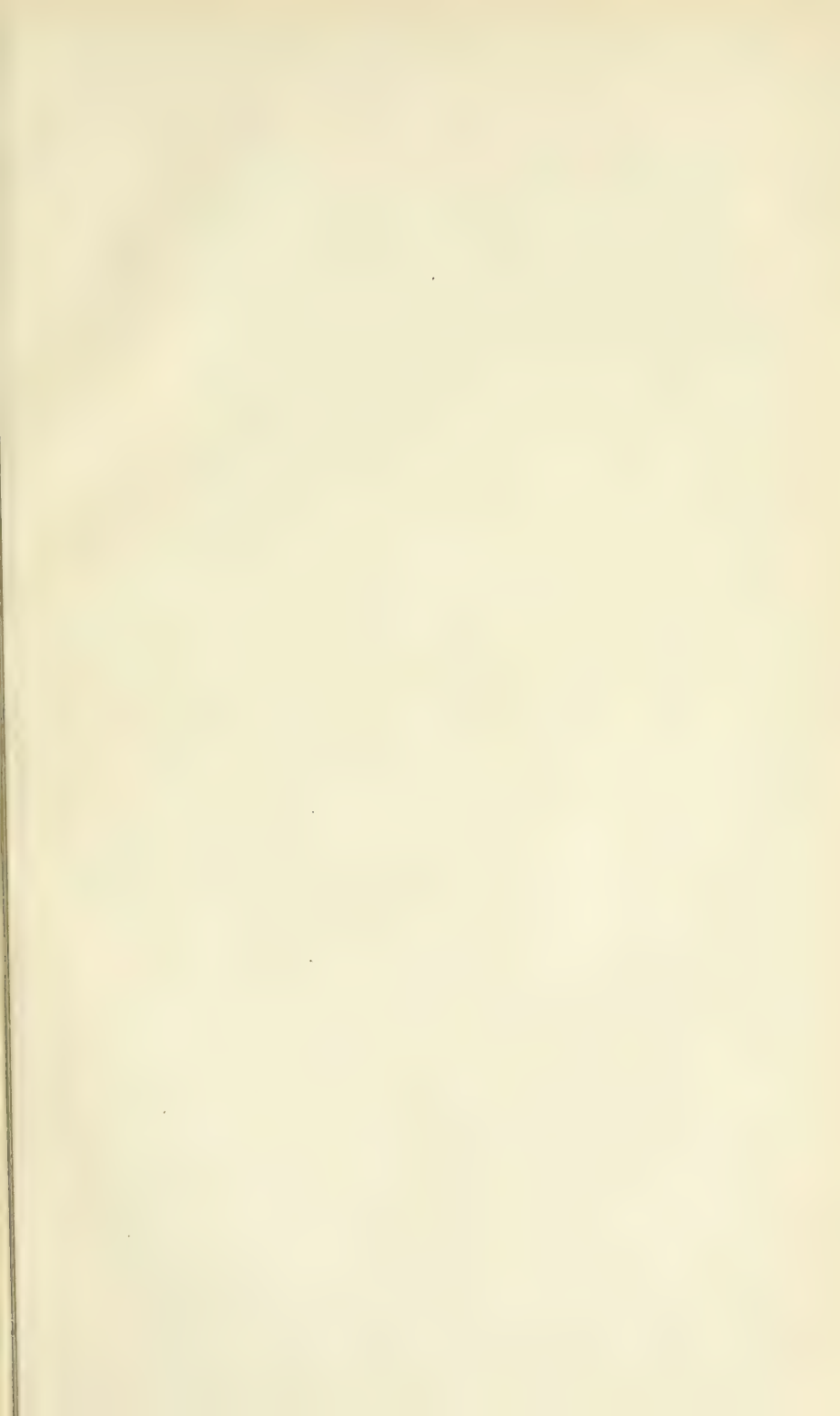
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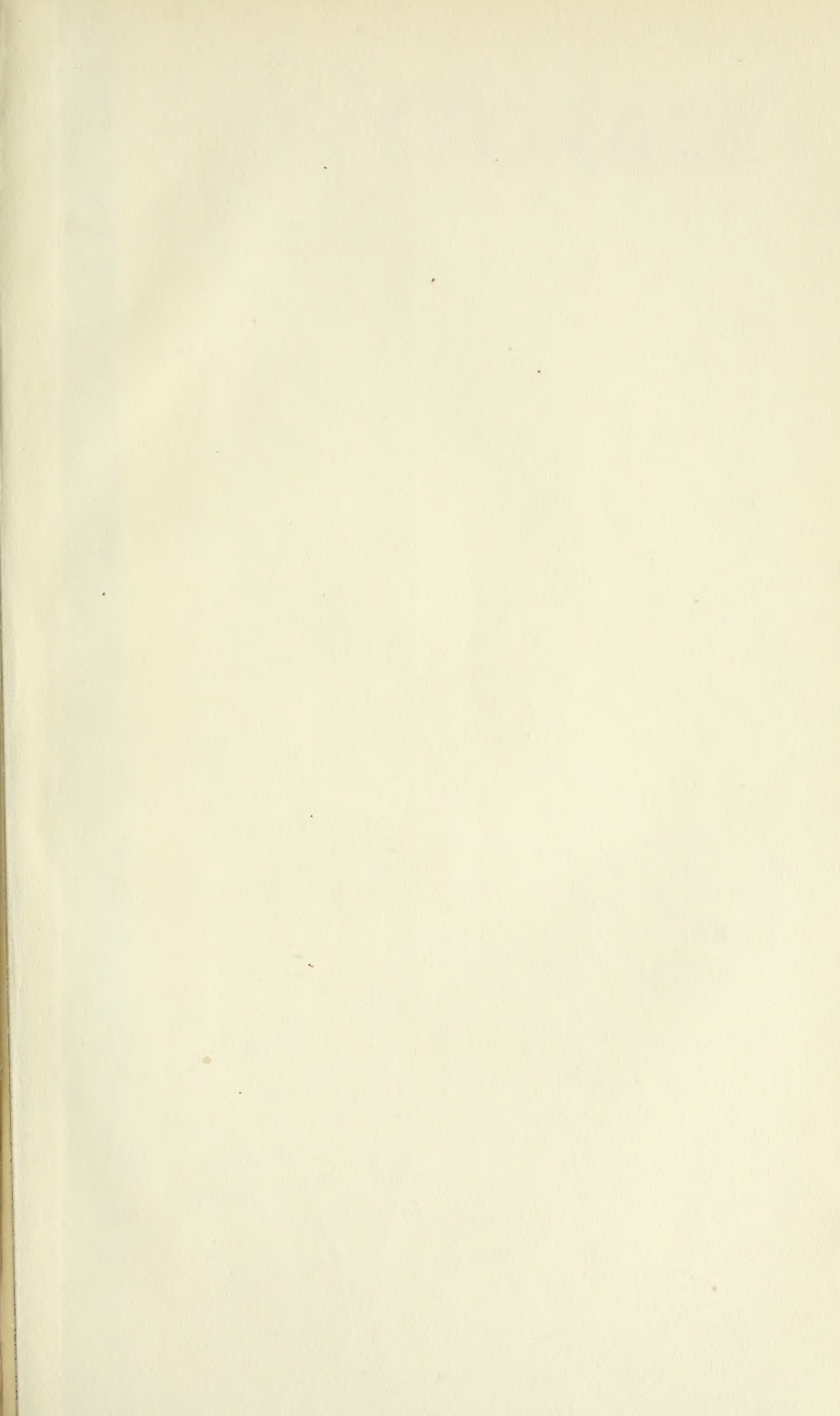
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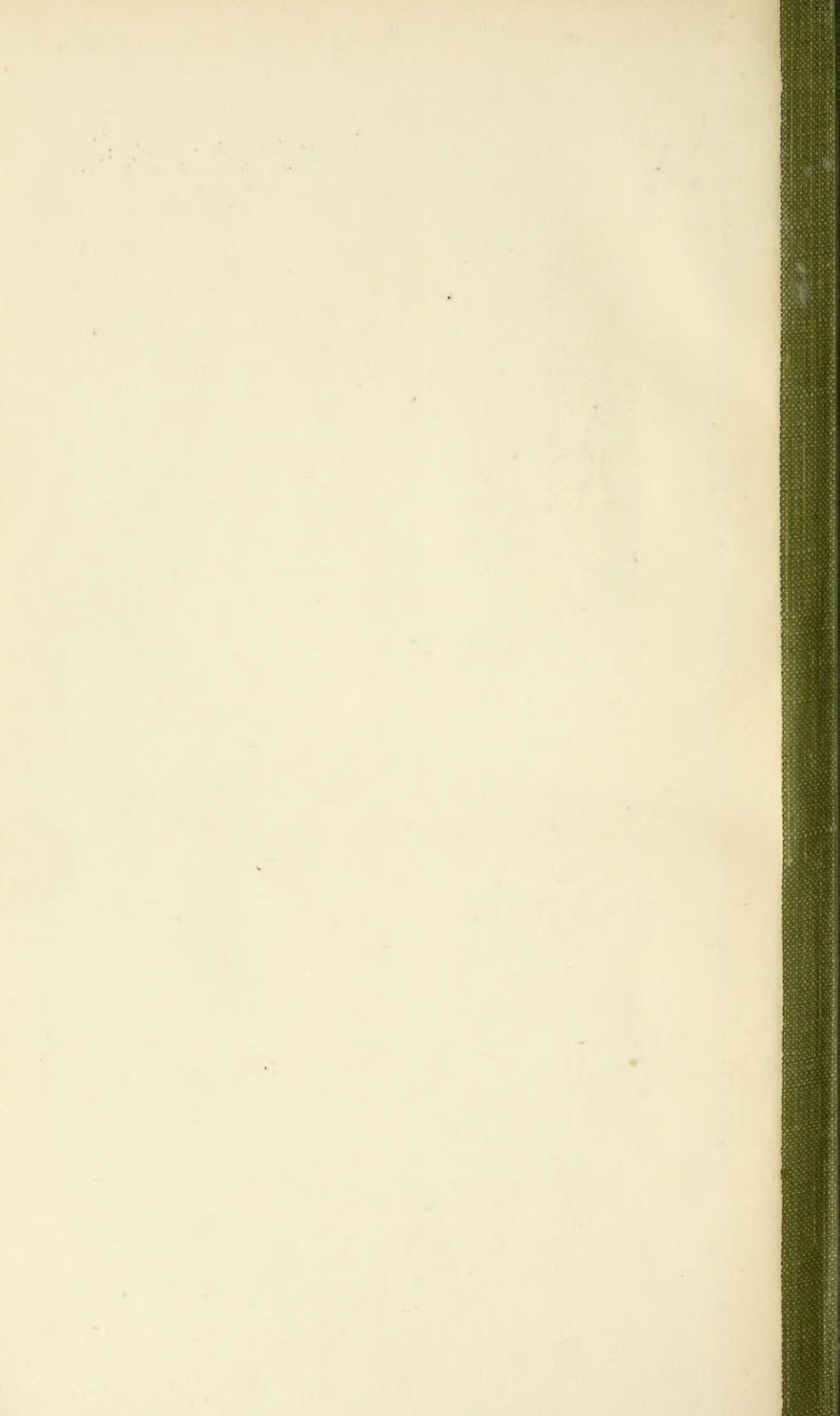
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